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This report is for use as a guide to agencies interested in developing emission inventory questionnaires. It addresses both the physical and psychological constraints on questionnaire design.

The report discusses general considerations for maximizing the success of a questionnaire; the factors that vary the rate of return and the accuracy of responses; design considerations for optimizing the conversion of questionnaire responses to computer input; and design considerations for the cover letter, instructions, general information section, and question section as individual elements of a questionnaire. The appendices include samples of several types of questionnaires.

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PREFACE

Questionnaires have become an important tool for conducting emission inventories. As the concern for our environment grows, so does the need for well designed emission inventory questionnaires. A questionnaire designer must consider options that will maximize the efficiency of the questionnaire, the return rate, and the accuracy of the resultant data. To this end, the knowledge gained by agencies that have become experienced in questionnaire design needs to be shared with all other agencies. This report has been written to address this need. It is intended to be used as a guide for all agencies interested in questionnaire design.

ABSTRACT

This report was written to act as a guide for agencies interested in developing emission inventory mail-out questionnaires. It addresses both the physical and psychological constraints on questionnaire design. The information provided is based on the knowledge of agencies and individuals that have experience in the art of questionnaire design.

The first section discusses the choice of mail-out questionnaires over other information-gathering methods. The second section describes the individual elements of a mail-out questionnaire - the cover letter, the instructions and the questions - and what should be included in each. The third section considers design considerations for maximizing the return rate and the accuracy. Formulation of appropriate questions is also addressed. The formatting of a questionnaire for computer input and the use of a computer's capabilities are described in Section 4. Follow-up procedures are discussed in Section 5. Appendices include sample questionnaire elements.

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1.0 INTRODUCTION

1.1 Purpose

This document is designed to help those agencies which decide to use questionnaires as part of their emission inventory process. It is intended as a guideline for the preparation of effective questionnaires suitable for a variety of situations.

This document is not intended as a source of complete questionnaires to be used as-is. Though sample portions of questionnaires are included as references in the text and in an extensive appendix, each agency is urged to compile its own questionnaires to meet its particular needs.

It may not be possible to adhere strictly to the suggestions made in this document. Local and state laws, the information needs of the agency, and the agency's manpower and resources may dictate alternate approaches. There also may be no single "best" questionnaire for any given situation because of the many factors which must be considered.

1.2 Background

Emission inventories are conducted by air pollution agencies to assess air quality problems and to determine the important pollutants and pollutant sources in a particular area of concern. Some inventories are conducted regularly or periodically while others are used to update previously acquired information. An inventory may be concerned with many pollutants in the area or it may be concerned with only one. It may ask for annual emissions or it may ask for instantaneous emissions to be used for modeling purposes.

Emission inventories may be conducted in one of several ways, according to the needs and resources of the agency. If only a few industries are involved, if a small amount of information is needed from each one, and if written verification is not necessary, telephone calls may suffice. Plant visits by agency personnel may be applicable when there are few industries and/or a small geographical area involved. In these cases, in-depth interviews can be inexpensive and quite productive.

In many instances, however, especially if there are numerous industries, a lot of information needed, or a large geographical area, the mailed-out questionnaire is the most practical method for conducting an emission inventory. Before beginning one, however, the agency should determine whether it has the manpower and resources to develop the questionnaire, to print and mail it, to review the returns and follow up delinquent ones, and to compile and analyze the results.

No one questionnaire format can be suitable for all needs. Questionnaires can range from a one-page form for dry cleaning or service station establishments to a multipage (10 to 50 pages) mail-out to complex chemical plants. Sometimes the same questionnaire format can be used many times; sometimes a new one must be designed for a specific purpose.

In all cases, the psychological factors inherent in any questionnaire must be considered. Its results will be affected by the recipient's working relationship with other agencies and with the public. Likewise, future questionnaires may be affected by the courtesy and consideration with which the present survey is conducted.

To be successful, a questionnaire must have a relatively high response rate and the agency must have some indi-

cation of the nature of the delinquent recipients' facilities. Such a response will require painstaking consideration of each of the suggestions made in this document.

1.3 Approach

Section 2 of this document describes the basic elements of an emission inventory mail-out and discusses what is included in each. Briefly, the cover letter introduces the questionnaire and establishes its importance with a statement of any regulation which requires the recipient to respond. The instructions give any pertinent information about the questionnaire as a whole and, if necessary, instructions for specific kinds of questions. The questionnaire itself may include both general information questions about the facility and its operation and specific questions about particular processes and emissions. These questions may be arranged by source (all questions about one emission point on one page) or by subject (one subject to a page).

Section 3 addresses topics which must be considered in the development of a successful questionnaire. Return rate and accuracy are emphasized. Among the topics discussed are choosing the right questions, the size and visual impact of the mail-out as a whole, provisions for confidentiality, and the organization and format of the questions.

Designing a questionnaire for computer input is discussed in Section 4. Included in this section is a sample questionnaire before and after reformatting for the computer.

The follow-up work which must be done after a questionnaire is mailed out is considered in Section 5. This work includes checking all responses for accuracy and completeness,

contacting delinquent recipients and tabulating and/or transcribing the responses. No questionnaire effort is complete until every effort has been made to obtain a response from each recipient and all resulting data has been properly compiled.

The Appendix contains samples of the individual parts of a mail-out and a sample follow-up letter. It also contains a list of supplementary references and sample pages from "Compilation of Air Pollutant Emission Factors" (AP-42) and the National Emission Data System (NEDS) Questionnaire.

2.0 ELEMENTS OF AN EMISSION INVENTORY QUESTIONNAIRE

An emission inventory questionnaire mail-out has three basic elements: the cover letter, the instructions, and the questionnaire itself. Their format and content depend on the kind of inventory being conducted.

A questionnaire which addresses all pollutants from all large industrial plant sources can best be designed with a common cover letter, a common general instruction section, a common general information question section and a separate specific industry process question section (possibly with additional instructions) for each class of industry. An inventory of emissions from many different area sources may have a common cover letter, but should have separate instructions and question sections for the different types of sources.

The sections below describe the contents of these elements. Samples of the elements are provided in the Appendix.

2.1 Cover Letter

Within a questionnaire, the cover letter is the initial contact with the recipient. The importance that he assigns to the questionnaire will be based on its content. Unless the cover letter catches the recipient's attention, the questionnaire may be discarded or filed away until some time in the indefinite future.

The information which should be included in the cover letter is listed below:

- A citation of regulations which requires the recipient to respond,

- Provisions for confidentiality, if applicable,
- A statement of the purpose of the questionnaire,
- A respectful request for cooperation in filling out the questionnaire,
- A final due date for the completed questionnaire,
- The name of a person with the agency who can be contacted for questions.

As with all sections of a questionnaire, the cover letter should be as short and direct as possible. The general instructions (see Section 2.2), however, may be combined with the cover letter if practicable. Example cover letters and cover letters combined with sample instructions are included as Appendix A.

A strong statement about the law which requires a recipient to respond to the questionnaire is the agency's most powerful tool for maximizing the return rate. Some recipients will refuse to fill out a questionnaire unless they realize that they are legally bound to do so. Many others will procrastinate as long as possible. The recipient should be aware from the outset that he will not be forgotten if he does not comply.

The questionnaires with the strongest legal statements have been the most successful. The strength of the statement, of course, is a reflection of the strength of the regulation. Each state should have an effective regulation, according to the Environmental Protection Agency regulations on the preparation of State Implementation Plans, Title 40 of the Code of

Federal Regulations, Section 51.11. However, some states have not fully implemented these requirements.

Provisions for confidentiality may be established in the cover letter or on the general information page. Mentioning confidentiality in the cover letter provides early notification of its availability.

A statement of the purpose of the questionnaire helps to motivate the recipient by providing him with a connection between his efforts and the final product. He should also be given the feeling that the information that he will provide is important. Some recipients may be motivated by reading that their efforts will contribute to the maintenance or improvement of air quality.

The request for cooperation should briefly tell the recipient what he is required to fill out. This helps the recipient relate to the questionnaire by providing him with an indication of what to expect after the cover letter. If the instructions for the questionnaire are brief, they may also be included here.

The final due data for returning the questionnaire may be specified either as a certain date or as a period of time after the recipient receives the questionnaire. The due date for each questionnaire must be carefully recorded so that the agency will know when to issue follow-up letters or phone calls to non-responding recipients.

The questionnaire recipient should be given the name, phone number, and address of at least one person in the agency to be contacted for questions. If there are many optional contacts, the recipient may be referred to a separate, categorized list of contacts that follows the cover letter.

2.2 Instructions

Some questionnaires have two sets of instructions, a set of general instructions which explains how to answer the questions and another set which explains how to prepare a process flow schematic and a plant layout diagram. These two sets of instructions may be combined, or there may be only the general instructions. Sample instruction pages, both general instructions and diagram instructions, are included in this document as Appendix B.

General information that affects the whole questionnaire should be included on the instruction page. For example, if the questionnaire is a general one, the instructions should explain that the questionnaire was designed for a variety of operations and that some questions, sections, or pages might not apply to a specific facility. They should also indicate which sections or pages should be completed for which processes or facilities. If the question pages are designed for direct coding to computer input, the instructions should explain how to enter numbers properly. The instructions for a process flow schematic or a plant layout diagram should, if possible, include a sample diagram. It is best to have the samples adjacent to the instructions which they exemplify.

In addition to explaining how to complete the questionnaire, the general instructions should provide the specific year,

or other appropriate period of time, for which all data are requested. The contact name and the return date might optionally be included with the instructions instead of with the cover letter. If the general instructions are short, they may be combined with the cover letter, as explained in Section 2.1.

2.3 Questionnaire

The general information section of a questionnaire identifies and locates the facility; it also solicits emission and activity levels for both the facility as a whole and its peripheral operations. The process details section covers the specific operations at the facility; it solicits information on activity levels equipment involved, and emission points in each process.

The distinction between these two sections may not be evident in a sample questionnaire such as an industry specific questionnaire for a single pollutant, but it should be considered in the preparation of any questionnaire.

2.3.1 General Information

The following information is usually solicited in the general information section:

- Facility's name and mailing address, if different from label,
- Facility's location, if different from mailing address,

- Plot plan,
- Applicability of the questionnaire,
- Fuel used in entire facility,
- Waste disposal practices,
- Other identification information, such as the operating schedule, the anticipated growth rate, the SIC, or the number of employees, only if required by the agency for present or future needs,
- Confidentiality, if desired, and
- Name and phone number of a person associated with the facility that the agency can contact.

Since the facility name and mailing address are usually obtained by the agency before mailing out a questionnaire, there may be no reason to ask the recipient to provide it. In some instances, however, the questionnaire may be sent to a home office and the facility name and address may not be known to the agency. If the facility name and address are given by the agency, there should be space provided for address correction.

The type of information required for plant location varies with the needs of the inventory. Sometimes an address/location is sufficient. A scale diagram of the plant layout (plot plan) may be necessary for accurately locating the source for plume dispersion modeling. To be useful, diagrams should have labeled clearly all processes, emission points, and control

devices with the same identification names or numbers that are used for entries in the questionnaire.

Many inventories require UTM coordinates. The instructions for determining these coordinates must be long and detailed, the level of effort required is high, and the chance of error is significant. (On the other hand, it would be quite costly for the agency to determine UTM coordinates for every facility.) This information should be on file somewhere at the plant, on property records, or in regional agency records.

One compromise solution has been to ask the recipient for the most detailed information to which he has access. In other words, he is asked to supply UTM coordinates, if available, and if not, to supply as much information as possible to help the agency determine them. A problem with this approach is that the agency may receive random information unless it specifies exactly the types of information needed. One possible solution is illustrated on page C-4 in Appendix C.

Each questionnaire should include immediately after the identification information a statement of the conditions under which the questionnaire would not apply to the recipient's facility. The recipient should be asked to check a box and return the questionnaire if it is not applicable.

Fuel use and waste disposal data might also be required by the agency. Fuel use data may be for space heating and/or for total fuel use. Wastes may be burned, land-filled, sold, or disposed of in some other manner. If wastes are sold to another industry or contracted out, the name and address of the purchaser may alert the agency to a previously unknown source of emissions.

For large or complex facilities, an operating schedule may be needed for each emission source. In this case, it might be simpler to request operating schedule information along with the specific questions about each source instead of with general information questions.

A request for operating schedule information should fit the needs of the inventory. The level of detail required should not exceed the requirements of the end uses of the inventory. For example, seasonal operating schedules are sufficient for inventories used to calculate seasonally adjusted emissions, whereas daily operating schedules, such as hours/day and days/week, are required for inventories used to identify sources to be controlled during emergency episodes.

Anticipated growth rates might be required by the agency for planning or modeling. The information can be requested as a percentage of growth or decline over a specified number of years. As with other information, it should only be requested if needed for the purpose of the inventory.

There are several methods which will provide for confidentiality. These methods are discussed in Section 3. It is important that confidentiality be available to those who need it, but not so easily available that everyone will ask for it.

The agency needs to know the name of the person who is responsible for the responses given to a questionnaire and, in some cases, the names of other people who participated in its completion. These names can be solicited directly or as signatures.

2.3.2 Emissions and Process Details

The question section of an emission inventory questionnaire solicits the information needed for the characterization of emissions. The kinds of questions asked will depend on whether an annual emissions inventory of many pollutants is desired or whether instantaneous average and maximum emission rates of one or more pollutants is needed for modeling or other purposes. It is most important that the information requested is both needed and not already on hand.

A complete question section for such questionnaires may ask for the following types of information:

- Activity levels for sources of emissions,
- Control system descriptions,
- Process flow diagrams with equipment descriptions,
- Plans for proposed changes to control equipment or operation procedures,
- Stack data,
- Emission rates from stacks, vents, and fugitive sources,
- Concentrations of elements in raw materials and end products,
- Stack test results,

- Physical and chemical characteristics of emissions,

- Efficiency of control systems,

- Any additional descriptive information.

The first five types of questions can be answered by all recipients. Some recipients will not be able to answer the next five. It is essential, therefore, that the first questions solicit enough information on the operation of a facility so that emission values can be verified if given and calculated if not given. The agency must also be aware of all sources of emissions that are likely in each type of facility. Categories of sources of emissions and emission rates as related to various activity levels, such as pounds of emissions per ton of product, etc., are discussed in AP-42, "Compliation of Air Pollutant Emission Factors."[5] Some example pages from AP-42 are included for reference in Appendix E.

Emission types may include process emissions; combustion emissions from heat, steam, or power production, incineration or open burning emissions; evaporative loss emissions from volatile organic storage, loading, unloading, or fugitive emissions. Activity levels which can be used to compute emission levels include fuel usage, raw material usage, production figures, and operating schedules.

The agency should refer to AP-42 and ascertain that the appropriate information is requested for each industry so that the emission factors can be used to calculate emission rates. The questionnaire, however, should not refer to AP-42, and the recipient should not be encouraged to use it to quantify emissions.

Emission rates are usually one of the main questions of a questionnaire. These rates, incidentally, cannot be held confidential in any state according to Section 114 of the Clean Air Act and Amendments. One of the uses for a questionnaire might be to provide data for the National Emissions Data System (NEDS). The data requirements for this system are discussed in EPA-450/2-77-028, "Procedures for the Preparation of Emission Inventories for Volatile Organic Compounds." Sample question pages for the NEDS are included in Appendix E of this document.

The agency might also need to quantify different classifications of emissions. Actual emissions are those related during a specific time period, either a long term average or a short term maximum. Upset emissions are those released during the same time period due to control equipment downtime. Potential emissions are those estimated to be released if there were no control equipment being used. For the sake of comparison, allowable emissions or those stipulated by government regulations or source permits may also be desired.

Many small facilities in an area are often considered collectively as an "area source." Drycleaning establishments and service stations are common examples. In many of these instances the questionnaire may go to the parent company instead of the individual operator.

If a plant gives an estimate of its emissions, it is important that the source of the estimate also be given. Emissions estimates based on data from another plant or on emission factors may not be as accurate as those estimated on-site.

The agency may ask for emission test results and material balances, if available. These results are especially valuable if they are the basis for other information supplied by the company

or if there are fugitive emissions. Fugitive emission data should be solicited for each operation or phase of each process.

The agency also should ask for the type and the efficiency of all control equipment. To be most accurate, control efficiencies for each type of pollutant might be requested. Some control equipment reduces the emissions of more than one type of pollutant; venturi scrubbers, for example, can be used to control both particulates and sulfur dioxide. The efficiency of particulate scrubbers varies with the particle size. Expected ranges of efficiency for specific control equipment can be found in APTD-1570, "National Emissions Data System Control Device Workbook."[6] The agency might also want to know the fuel requirements for control devices.

Stack data are required for plume and other dispersion modeling. These include stack height and diameter, and gas temperature and velocity or flow rate. Other data requirements for plume dispersion modeling are discussed in the document "Guideline on Air Quality Models."[7]

The agency might also require information on the physical or chemical characteristics of emissions. For example, the particle size distribution of particulates might be needed. For air oxidant studies, the agency might need to know the composition of non-methane hydrocarbon emissions. The recipient might also be specifically asked to list emissions of other specific hazardous pollutants, such as chlorides or heavy metals, or he might simply be asked for the chemical composition of emissions. Sample formats for pollutant specific questionnaires are included on pages C-29, C-30, and C-31 in Appendix C.

Plans for proposed changes to control equipment or in operating procedures which could affect emissions should be solicited so that the agency can estimate how long these questionnaire results will be valid.

Another piece of information which may be requested is a schematic diagram of process flow. This diagram is a valuable aid for interpreting the data entered by the questionnaire recipient. For complex facilities, such as refineries or chemical plants, a schematic is essential. A sample process flow diagram is included as Page B-10 in Appendix B.

3.0 CONSIDERATIONS FOR DEVELOPING QUESTIONNAIRES

A successful questionnaire obtains the right answers to the right questions while maintaining a good working relationship with the recipients. To get the right answers, the agency must design the questionnaire for a high rate of return and a high rate of accuracy. To ask the right questions, the agency must carefully examine its information needs. To maintain a good working relationship with the recipients, the imposition caused by the questionnaire must be minimal.

These requirements are discussed in this section, both in general terms and as they apply to the specific parts of the questionnaire. In many instances the considerations are interrelated.

3.1 The Right Question

The right questions are those which solicit information which the agency needs, does not have, and cannot obtain easily from any other source. In considering its information needs, the agency should consider what it is going to use the information for. The end use should indicate how accurate, how specific and how current the information has to be. Information needs for the near future should also be considered.

Sometimes the information needs of several agencies can be met by one well-designed questionnaire. If feasible, the agency should solicit input from other agencies in the designing of the questionnaire.

After determining the present and near future information needs, the agency should check its files to determine if the information is already available. If it is not, the agency should consider all possible methods for obtaining it.

Possible methods other than questionnaires for obtaining information include the files of other agencies, phone calls or visits to plant facilities (more useful for small industries and small geographic areas), trade associations, and meetings with industry representatives. The choice of method will depend on the size of the industry, the type of information needed, and the agency's working relationship with other agencies and with industry. These other methods were discussed in Section 1.2. In general, questionnaires are most practical when there is a lot of information to be obtained, a lot of people to obtain information from, or a need to have written verification of the answers.

Even the right questions can be wrong if they are asked too often. Industry's sensitivity to an overload of paperwork from government agencies must be considered. Some information obtained once is valid for the life of the facility; other information must be updated often.

If possible, all information which the agency already has about the recipient's facility, such as mailing address, SIC number, UTM coordinates, registration numbers, etc., should be preprinted on the questionnaire. A window envelope could be used to expose the facility name and address. The recipient could then check them for accuracy and make only necessary corrections. An example of this approach is shown on page C-2 in Appendix C.

3.2 The Return Rate

The return rate of a questionnaire depends on several factors, not all of which are inherent in the questionnaire itself. Some recipients, for example, may bitterly remember the poor questionnaire they fumbled through only a short time ago. But there are several ways to convince the recipient that he should complete this one anyway. And here first impressions can be very important.

The recipient's first impression will be the very size of the document. It should be as brief as possible. Then as the recipient flips through the pages he should see uncluttered pages with easy-to read type and ample room for answers. Paragraphs should be short and well-spaced; questions should be in an aesthetic arrangement. A return envelope emphasizes the importance of the questionnaire and also indicates to the recipient that the agency is anxious to lessen the imposition.

3.2.1 Cover Letter

The cover letter will probably be the first part of the questionnaire that the recipient will actually read. It contains several items crucial to a high return rate:

- A statement about any laws which require the recipient to respond,
- Provisions for confidentiality, and
- A due date.

A strong statement about existing and applicable regulations which require a recipient to respond to the questionnaire

is the agency's most powerful tool for maximizing the return rate. The statement should be placed prominently in upper case type at the top of the cover letter as shown in Appendix A. It should cite any applicable regulations and specify penalties for noncompliance.

Confidentiality can be established in one of several ways. The simplest is a box to be checked to request confidentiality for all information other than emissions data given in the questionnaire. Justification for the request would be given by the recipient on a separate sheet.

The main advantage to this approach is that is clearly indicates the request to the agency. It also alerts the agency to look for supplementary supporting information. If the questionnaire is converted to computer input, a check in the confidentiality box can be programmed as a command to store all information in a limited access data file.

The disadvantages of this approach are that it does not provide confidentiality for only part of the information and that it may be too easy to use. It should be used only for recipients who are anticipated to be deeply concerned about confidentiality.

A more complex method for establishing confidentiality involves the assignment of a survey number to each questionnaire; this number would be also printed on the general information page. The agency director would detach the general information page from the returned questionnaire and store it in a locked file. Since all identification is presented on the general information page, no one would be able to associate the information on the question pages with a specific facility. If necessary, a facility could be identified at a later time by locating the survey

number in the locked file of general information pages. This consideration is especially important if the agency subcontracts to a private company for the interpretation and transcription of the information. If the information is computerized, the identification information could be entered into a separate limited access file.

Each agency should investigate local laws to ascertain that the identification concealment is not forbidden. The public's access to records varies among states.

A system which allows for partial confidentiality could be established by the following insert in the cover letter:

> Any proprietary information, which you believe is of a confidential nature, should be identified in a supplementary letter and appropriate data in the questionnaire marked with the word CONFIDENTIAL. A brief explanation in your letter for the desired confidentiality should be noted.

This system indicates clearly to the agency which information is confidential and which is not. It also alerts the agency to look for supplementary supporting information with each returned questionnaire that is marked anywhere with the word "confidential." Unless the marking is very clear, however, it is easier for the agency to overlook confidentiality with this system than with the other systems.

The final due date should be included in the cover letter so that it will not be overlooked by those who do not read instructions. This due date may be specified either as a certain date or

as a period of time after the recipient receives the questionnaire. The first approach is more specific, and gives the recipient a definite date to look at. With the latter approach, however, the questionnaire mailing can be staggered without having to reprint the due dates listed on the cover letters.

Staggered mailing is particularly important for large inventories with too many questionnaires to process at one time. The resulting staggered receipt more economically uses the agency's resources. Also, questionnaires can easily become lost or damaged while waiting to be processed by the agency.

Each correspondent should have an equal amount of time to respond. This time period should be large enough so that the correspondent is not overly rushed and short enough that the correspondent is not likely to forget.

3.2.2 Questions

Several factors in the design of the question section can affect the return rate. First, there should be a clear statement from which the applicant can determine whether the questionnaire is applicable to his facility. Then the questions must be well-arranged and easy to answer. These factors are discussed in this section.

A clear statement of applicability serves several purposes. If the questionnaire is applicable, the statement reinforces the necessity of compliance. If the questionnaire is not applicable and the recipient can easily process it as such, he may be more cooperative when one does apply to him. A maximum return rate on nonapplicable returns also means that the agency will not waste money following them up and will know which facilities are not producing the emissions being inventoried.

The use of a check box helps the agency distinguish between questionnaires that are not applicable and the ones that are returned without any response. Examples of statements of applicability are provided below.

- If this equipment was used at least five (5) days last year, complete the questionnaire,

☐ If this equipment was not used at least five (5) days last year, check this box and return this form,

☐ If this equipment has been removed, check this box and return this form.

Colored pages may be used to designate different sections of the questionnaire. Statements of nonapplicability at the beginning of each page or section can be used as an alternative or supplement to a general statement of applicability. For example, a page of questions about organic liquid storage emissions might begin with the following statement.

- If you stored organic liquids last year, fill out this page,

- If not, check this box and turn to the next page ☐ .

By supplying a check box, the agency can discriminate between pages which were forgotten and which were not applicable.

As mentioned earlier, brevity enhances the rate of return. The agency can usually reduce the bulk of the question

section by designing industry specific questionnaires instead of general questionnaires. Industry specific questionnaires are designed specifically for one particular industry, as opposed to general questionnaires applicable to a whole group of industries. For example, it is better to send an industry specific questionnaire with one question page to a dry cleaning establishment than to send it a multipage general organic solvent users questionnaire.

This consideration, however, must be balanced against the level of resources available to the agency conducting the inventory. It takes more money and manpower to design, mail out, and interpret many industry specific questionnaires than it does general questionnaires. Processing of industry specific questionnaires is lso more complex because the format of each specific questionnaire will vary. Furthermore, it is possible to send the inappropriate industry specific questionnaire to a facility.

General questionnaires may be preferable if the agency's resources are limited or if the agency is unfamiliar with many of the sources. Inventories for specific pollutants such as lead or volatile organic compounds may be most advantageously conducted with general questionnaires. Furthermore, general questionnaires may be more appropriate for large or complex facilities that are difficult to characterize. Most of these facilities will have engineers available to interpret the forms. If a general questionnaire must be used, it is even more valuable to provide a statement of applicability for each page.

Questionnaires that are organized so that all information about each source can be provided on one page (source by source) are usually easier to fill out than questionnaires that have separate pages for process, emission, control, and stack

information (subject-by-subject). For this reason, source-by-source questionnaires are usually considered the better format. However, if the questions are arranged by subject, industry specific questionnaires can be designed by simply selecting the subject pages that apply to each industry. Only a few supplementary pages of questions that are unique to an industry must then be formulated. Source-by-source and subject-by-subject questionnaires are illustrated in Appendix C.

Another method which can minimize the level of effort required from the recipient, and therefore enhance the return rate, concerns the format of the questions.

Multiple choice questions are the easiest type for the recipient to answer. Many questions can easily be formatted as multiple choice. For example, a question that asks the recipient to write in the type of control device used can be improved by supplying a list of conceivable control devices and asking the recipient to put a check next to the appropriate answer. Many multiple choice questions should include the choice "other" with a blank beside it for entering out-of-the-ordinary replies. Other questions, such as those that require exact numerical answers, can only be answered appropriately with a written response.

A series of questions that are to be answered repetitively can be put into a tabular format. Tabular data are easier to fill in and to process without errors if separate lines are provided for each series of entries. Questionnaires that require hourly or daily entries are especially suited to a tabular format. An example of a questionnaire requiring hourly entries is included on page C-26 of Appendix C.

As an alternative to a table for repetitive questions, the recipient could be asked to make a copy of a questionnaire

page for each set of answers. The latter approach is especially useful if the questions are long or if they can be put into a multiple choice format. This approach is illustrated on pages C-9, C-23, and C-24 in Appendix C.

3.3 Accuracy of Responses

To be considered accurate, questionnaire responses must provide both the type of information desired and the correct numerical data. To assure that responses will be accurate, every effort must be made not to confuse the recipient.

General instructions should be as precise as possible. Some of the least effective general instructions are those which explain in detail how to answer each question. With such instructions the recipient must refer to the instruction page each time he gets to a new question. This increases the work load and the change of error. If a particular question requires clarification, it is better to note the information on the same page as the question than to print it on a separate instruction page.

To reduce ambiguity, the following types of information should not be included in the general instructions.

- Units of measurement -- appropriate units of measurement should be specified on the question pages or the recipient should be explicitly requested to write them with the answers.

- Methods of calculation and conversion -- calculations and conversions should be performed by the agency, and

- Code numbers for entries -- all code numbers other than emission point numbers, if needed for computer input, should be entered by the agency.

Questions which do not need further explanation limit the errors caused by those who might otherwise read the wrong instructions for a question or by those who answer questions without reading the instructions however well written they may be. One way to call for specific responses is to print the type of units wanted for an answer right next to the answer space. Another way is to use the multiple choice format discussed earlier.

It is an advantage if samples can be provided with the instructions for process flow schematic and plant layout diagrams. Sample diagrams help the recipient to visualize what is expected; they are easiest to interpret if they are adjacent to the instructions.

If a consistent, standardized form is provided for periodic inventories, regular recipients will eventually learn how to provide the correct responses. This is the one condition under which a single generalized form for all facilities is acceptable. Results for the first administration of the questionnaire may be poorer than successive ones, but they will improve with each successive administration.

Industry specific language is especially important for non-technical personnel who do not have economically practical access to engineers or other technical personnel. If a general questionnaire is considered because of limited funds or because the agency is uncertain of the processes performed at a facility, it may be better to provide a packet of industry specific questionnaires with industry specific language than to provide a single generalized form.

Accuracy is also a factor in the decision to use the source by source or the subject-by-subject organization of the question section. With the subject-by-subject organization, the recipient must turn pages continually to enter information about each source of emissions. Mistakes can be made in the connections established between a process, its emissions, its associated control device, and its associated stack. Omissions of data can also easily go unnoticed. A mistake can also easily be made by assigning information to the wrong emission point number which should be shown on the process flow diagram along with all control equipment used. These problems also affect the agency when the data is processed. Process diagrams with numbered emission points can partially alleviate this problem.

4.0 DESIGNING FOR COMPUTER INPUT

The analysis of information/data received during the course of most inventories is aided by the use of a computer. The information below briefly discusses some of the possible uses for a computer and explains how to format a questionnaire for computer input. A sample of a questionnaire formatted for computer input is included in Appendix A.

4.1 Making Use of a Computer's Capabilities

A computer can be used throughout most stages of an inventory. Some of the functions that it can perform are the following:

- Prepare address labels and/or preprint information,
- Print assembled industry-specific questionnaire sets,
- Keep track of the status of the questionnaires,
- Store data,
- Perform calculations and conversions,
- Tabulate results, and
- Reformat data for future needs.

A computer can also be programmed to check the accuracy of the questionnaire responses by searching for illegible or inappropriate entries.

Instead of printing address labels, the computer can preprint the address directly onto the questionnaire form. It can also be programmed to search data files from previous inventories to find and preprint all other information that would probably remain unchanged, such as plant location and SIC numbers. The recipient then simply has to check the information for accuracy and make changes, if necessary. Preprinting saves work for the recipient and improves the accuracy of the responses. It is discussed in Section 3.1.

As a part of keeping track of the status of the questionnaires, a computer can be used periodically to print out lists of overdue questionnaires and those received. It can then be programmed to automatically print out follow-up letters to delinquent recipients.

One advantage to having a computer perform all emission calculations is that it can then be used to update existing emission inventories whenever a new emission factor is generated. If existing emission inventories are not updated, an agency will not be able to distinguish between real changes in emissions and false changes caused by the use of different emission factors in different years.

4.2 Formatting for Computer Input

To be converted to computer input, the information on a questionnaire must be put into a format that can easily be read by a keypunch operator unless the computer is programmed to accept

data input directly into a video display formatted the same as the questionnaire. The recipient and the keypunch operator, however, have different formatting needs. The recipient can only relate to spaces for complete answers, whereas the key punch operator can only relate to individual spaces for each number or letter.

This problem can be solved with two different approaches. One approach is to transcribe data from the questionnaires to a separate computer input form, such as the computer input form in Appendix E-1. A second approach is to reformat the questionnaire so that the data entered by the recipient can be read almost directly off the form by a keypunch operator. Examples of a questionnaire before and after reformatting are shown in Figures 4-1 and 4-2.

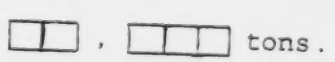
Each approach has its relative advantages. The first is easier to use by the keypunch operator and is faster to use for proofreading the resultant keypunched cards; transcribing data to a separate form, however, it is extremely time consuming and also introduces an additional chance of error. The reformatted form, however, is a compromise between the ideal form for a recipient and that for a keypunch operator; as such, it is a bit more difficult for each to use than the separate forms associated with the first approach.

The three basic steps for reformatting questionnaires are summarized below:

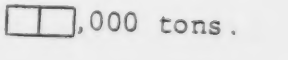
- Decide which information to keypunch,
- Provide answer boxes for each response to aid the recipients, and
- Provide numbers beneath or above each answer box to aid the keypuncher.

As part of the first step, the agency may decide not to keypunch all of the information on the questionnaire form. For example, it may not be necessary to keypunch the names of the facilities if inventory identification numbers are being used. For the information that is needed, the agency should try to provide multiple choice questions. Answers to such questions are easier to keypunch than more subjective responses and require less space on a computer card. If the multiple choice format is used, however, the optional answer of "other" with a fill-in space should be provided for those responses that cannot be fitted into the printed ones. It is better for the agency to interpret answers than to force the recipient to do so.

The second step in reformatting is to provide boxes for each answer. Multiple choice questions should have one box for each acceptable answer. Fill-in questions should have at least one box for each letter and number anticipated in the answer. This requires that the agency estimate how long each answer will be. For numerical answers, the range of values expected for each answer must be determined. For example, if the answers are expected to range between 10 and 99,000 tons, then five boxes must be provided:



Alternately, if answers between 1,000 and 99,000 tons are expected and they need be accurate only to the nearest thousand, two boxes must be provided:



Commas and decimals placed correctly help the recipient to understand what is expected. The problem with this system is that

Emissions Inventory

Data for year ____

WOOD PRODUCTS INDUSTRY

Name of Company:_____Plant ID No._____

Location:_____

Number of actual operating days_____Normal operating schedule:___hrs/day

___days/wk___wks/yr

Check one of the following Mill Types:

____Type A - Circular Head-saw; with or without trim saws
____Type B - Circular Head-saw; edger, trim saws
____Type C - Circular Head-saw; vertical band resaw, edger, trim saws
____Type D - Band Head-saw; edger, trim saws
____Type E - Band Head-saws; horizontal band resaw, edger, trim saws
____Type F - Band Head-saw; cant-gangsaw, edger, trim saws
____Type G - Round-log gangsaw; edger, double-end trimmer

_____BF Doyle logs processed OR _____International Units

_____BF lumber produced (Green Lumber Tally)_____Other (Specify Units)

Emission controls:_____Cyclones _____Multiclones_____Bagfilters_____Scrubbers

RESIDUES

Type	Quantity (Specify tons, cords, etc.)	Uses (% of each)		
		Landfill	Burned	Sold
Chips				
Bark				
Sawdust				
Shavings				

How is material conveyed?_____Pneumatically (Air blown)_____Mechanically (Drag chains or conveyor belts)

If pneumatic, give the following information relating to cyclones:

EPN	Diameter	Height	Residue Type

Figure 4-1. Typical Industry Specific Questionnaire (continued on page 36)

FOR OFFICE USE ONLY

Form: [ ] [ ] Year 19[ ] [ ]

Plant ID No. [ ] [ ] [ ] [ ] [ ] [ ]

WOOD PRODUCTS INDUSTRY

Name of company: _____

Location: _____

Number of actual operating days: ____ Normal operating schedule: [ ] [ ] hrs/day [ ] days/wk [ ] [ ] wks/yr

Check one of the following mill types:

[ ] Type A—Circular head-saw; with or without trim saws

[ ] Type B—Circular head-saw; edger, trim saws

[ ] Type C--Circular head-saw; vertical band resaw, edger, trim saws

[ ] Type D—Band head-saw; edger, trim saws

[ ] Type E--Band head-saws; horizontal band resaw, edger, trim saws

[ ] Type F—Band head-saw; cant-gangsaw, edger, trim saws

[ ] Type G--Round-log gangsaw; edger, double-end trimmer

[ ] [ ] [ ],000 BF Doyle logs processed OR [ ] [ ] [ ] International Units

[ ] [ ] [ ],000 BF lumber produced (green lumber tally)_____ [ ] Other (specify units)

Emission controls: [ ] Cyclones [ ] Multiclones [ ] Bagfilters [ ] Scrubbers

FOR OFFICE USE ONLY: Card No. [1]

RESIDUES

Type	Quantity	Uses (Percent of each)		
	[ ] Tons [ ] Cords [ ] Other _____	Landfill	Burned	Sold
Chips	[ ] [ ] [ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]
Bark	[ ] [ ] [ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]
Sawdust	[ ] [ ] [ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]
Shavings	[ ] [ ] [ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]

How is material conveyed? [ ] Pneumatically (air blown) [ ] Mechanically (drag chains or conveyor belts)

If pneumatic, give the following information relating to cyclones:

EPN	Diameter	Height	Residue Type			
			Chips	Bark	Sawdust	Shavings
[ ] [ ]	[ ] [ ] ft	[ ] [ ] ft	[ ]	[ ]	[ ]	[ ]

Figure 4-2. Typical Industry Specific Questionnaire Redesigned for Computer Input (continued on page 37)

Wood Products Industry (continued)

COMBUSTION

Dry kilns:_____Yes _____No

EPN_____

Type:_____Gas _____Steam _____Wood

Quantity of wood burned_____tons

Conical (Teepee) Burner: _____Yes _____No

EPN_____

Quantity of residue burned_____tons

Check which is applicable to your teepee operation:

_____Radial overfire air supply near bottom of shell and many gaping holes in shell
_____Radial overfire air supply near bottom of shell
_____Adjustable underfire air supply and adjustable, tangential overfire air inlets

Boiler(s): _____Yes _____No

EPN_____

Fly-ash reinjection: _____Yes _____No

Quantity of fuel used: _____tons of bark_____tons of wood_____mcf of gas

Emission controls:_____Cyclone _____Multiclone Other (specify)_____

Stack Data: Height_____ft Diameter_____ft Temperature_____°F

ACFM_____ OR Velocity (fps)_____

For square stacks: Length_____ft Width_____ft

Short Stack: _____Yes _____No

Permit Numbers since (date):_____

Describe all non-permitted changes to your opearation since (date) e.g., added a scrubber to boiler EPN B-10. You may use back if necessary.

COPY THIS PAGE FOR ADDITIONAL KILNS OR TEEPEE BOILERS.

Figure 4-1 (continued from page 34)

Wood Products Industry (continued)

COMBUSTION

Dry kilns: ☐ Yes (57-1) ☐ No (57-2) Type: ☐ Gas (58-1) ☐ Steam (58-2) ☐ Wood (58-3)

EPN ☐☐ (59-60) Quantity of wood burned: ☐☐☐,☐☐ (61-63, 64-65) tons

Conical (Teepee) Burner: ☐☐☐.☐☐ (66-68, 69-70) tons of residue burned

EPN ☐☐ (71-72)

Check which is applicable to your teepee operation:

☐ (73-1) Radian overfire air supply near bottom of shell and many gaping holes in shell

☐ (73-2) Radian overfire air supply near bottom of shell

☐ (73-3) Adjustable underfire air supply and adjustable, tangential overfire air inlets

FOR OFFICE USE ONLY: Card No. 2

Boiler(s)

EPN ☐☐ (1-2)

Fly-ash reinjection. ☐ (3) Yes ☐ (4) No

Quantity of fuel used: ☐☐,☐☐☐ (5-6, 7-8-9) tons of bark ☐☐,☐☐☐ (10-11, 12-13-14) tons of wood ☐☐,☐☐☐ (15-16, 17-18-19) mcf of gas

Emission controls: ☐ (20) Cyclone ☐ (21) Multiclone ☐ (22) Other (specify)_____

Stack data: Height ☐☐☐ (23-24-25) ft Diameter ☐☐ (26-27) ft Temperature ☐☐☐☐ (28-29-30-31) °F

Flow rate ☐☐☐☐ (32-33-34-35) ACFM OR Velocity ☐☐☐ (36-37-38) fps

For square stacks: Length ☐☐ (39-40) ft Width ☐☐ (41-42) ft Short stack: ☐ (43) Yes ☐ (44) No

Permit numbers since January 1977: ☐ (45)-☐☐☐☐ (46-47-48-49) ☐ (50)-☐☐☐☐ (51-52-53-54) ☐ (55)-☐☐☐☐ (56-57-58-59) ☐ (60)-☐☐☐☐ (61-62-63-64) ☐ (65)-☐☐☐☐ (66-67-68-69)

FOR OFFICE USE ONLY: CARD No. ☐ (80)

EPN ☐☐ (1-2)

Fly-ash reinjection: ☐ (3) Yes ☐ (4) No

Quantity of fuel used: ☐☐,☐☐☐ (5-6, 7-8-9) tons of bark ☐☐,☐☐☐ (10-11, 12-13-14) tons of wood ☐☐,☐☐☐ (15-16, 17-18-19) mcf of gas

Emission controls: ☐ (20) Cyclone ☐ (21) Multiclone ☐ (22) Other (specify)_____

Stack data: Height ☐☐☐ (23-24-25) ft Diameter ☐☐ (26-27) ft Temperature ☐☐☐☐ (28-29-30-31) °F

Flow rate ☐☐☐☐ (32-33-34-35) ACFM OR Velocity ☐☐☐ (36-37-38) fps

For square stacks: Length ☐☐ (39-40) ft Width ☐☐ (41-42) ft Short stack: ☐ (43) Yes ☐ (44) No

Permit numbers since January 1977: ☐ (45)-☐☐☐☐ (46-47-48-49) ☐ (50)-☐☐☐☐ (51-52-53-54) ☐ (55)-☐☐☐☐ (56-57-58-59) ☐ (60)-☐☐☐☐ (61-62-63-64) ☐ (65)-☐☐☐☐ (66-67-68-69)

FOR OFFICE USE ONLY: Card No. ☐ (80)

Describe all non-permitted changes to your operation since (date), e.g., added a scrubber to boiler EPN B-10. You may use the back of this sheet.

COPY THIS PAGE FOR ADDITIONAL KILNS OR TEEPEES OR BOILERS.

Figure 4-2 (continued from page 35)

there are no provisions for unexpectedly large answers. For example, there is no way to record 100,000 tons in the above two examples. A possible solution is to request the answer in scientific notation. The number 1,200,000 or 1.2×10^6 could be recorded as

[1] [2] E [6]

This type of answer, however, may be confusing for the recipient and may lead to order of magnitude errors; its use should be limited to major industries and a thorough explanation should accompany its use.

Boxes should also be provided for alphanumeric entries, such as the facility name and mailing address, if needed. It is difficult to anticipate the longest alphanumeric entry. Two alternative approaches might be used. One is to leave enough boxes for most answers and to instruct the recipient to abbreviate answers that are too long. Another is to leave a blank line for the answer and to instruct the keypunch operator to type in only as much of the answer as possible within a specific number of spaces on the keypunch card. The latter is better because it provides the agency with a written copy of the complete answer. This approach was used to format the company name and address in Figure 4-2.

The third step is to provide numbers beneath each box. They tell the keypunch operator which space on a computer card corresponds to each box. The first spaces on each card should be assigned to information that can be used to identify the specific questions associated with the information on each card. This information might include an inventory or account number and the year of the inventory. The keypunch operator should be instructed to repeat this information automatically at the beginning

of each card for a questionnaire. The sequential card number should also be typed in at the beginning or the end of each card. This provides enough information so that the cards can easily be put in order. Spaces for the above information should be set apart from the rest of the questionnaire and labeled "for office use only" (see Figure 4-2), since the information should be provided by the agency.

The remaining spaces on each computer card should be assigned to the recipient's responses. Answers to multiple choice questions can be grouped together under one number. One space for a symbolic answer (X) or several spaces for a subjective answer may be allocated for the response to "other". However, some provision should be made for storing in the agency's data file a complete response to such questions. A secondary number or letter would then be assigned to each acceptable answer so that the keypunch operator would know which number or letter to type into the assigned space. In other words, in the example shown below (taken from Figure 4-2), if the recipient has checked Type C, the keypunch operator would know to type the number 3 into space 59 of the computer card.

Check one of the following mill types:

59-1 ☐ Type A—Circular head-saw; with or without trim saws

59-2 ☐ Type B—Circular head-saw; edger, trim saws

59-3 ☐ Type C--Circular head-saw; vertical band resaw, edger, trim saws

59-4 ☐ Type D--Band head-saw; edger, trim saws

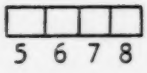
59-5 ☐ Type E--Band head-saws; horizontal band resaw, edger, trim saws

59-6 ☐ Type F—Band head-saw; cant-gangsaw, edger, trim saws

59-7 ☐ Type G--Round-log gangsaw; edger, double-end trimmer

Each box for a fill-in answer should be assigned its own number. Blank lines for alphanumeric fill-in answers could be assigned numbers to indicate the beginning and the end of the field allotted on the computer card. This system is not as suitable for numerical answers, since the keypunch operator would not know specifically in which space to type each number. For example, compare the following entries:

206
5 8



The keypunch operator could make a mistake by typing the first entry as 2, 0, 6, blank, which could be read by the computer as 2060. There is much less chance of this error with the second entry.

In most cases, numbers provided underneath the answer spaces will not be confusing to the recipient. If there is fear that they may be, the numbers could be printed on a separate overlay. The keypunch operator would then simply have to place the overlay on top of the questionnaire before keypunching the data. The agency would have to make sure that the correct overlay is used with each questionnaire.

Some responses may need to be coded by the agency. Extra spaces can be left next to each answer that is to be coded by the agency. These spaces should be clearly separated from the spaces left for the recipient's responses. They could be enclosed in boxes and labeled "for office use only" or placed in a separate column so labeled. As an alternative, the extra spaces could be

printed on an overlay instead of on the questionnaire. The overlay could also include all of the computer card position numbers, as discussed above. Care would then have to be taken to keep each coded overlay with its associated questionnaire.

5.0 FOLLOW-UP

The work on a questionnaire has only begun when the mailing is done. Several important tasks remain: checking the accuracy and completeness of responses, contacting delinquent recipients, and tabulating and/or transcribing the responses. In addition, all agency personnel who were listed as contacts on the questionnaire should confer with each other to be sure the advice they are giving is consistent.

Each questionnaire should be reviewed as soon as possible after it is received. Immediate tabulation also helps the agency to determine which recipients are delinquent and to spot questionable data. If the inventory is large, the mailings can be staggered so that all of the questionnaires are not returned at the same time.

All questionnaires should ideally be checked by engineers to see if the questions have been answered properly and to see if the data provided are reasonable. Process flow and plant layout diagrams help the engineer to interpret the responses. Ideally, questionnaires from each industry should be checked by engineers who have worked in or are very familiar with the industry.

To ascertain that the total emissions and activity level results from a questionnaire are reasonable, the totals should be compared to those which can be extrapolated from data from other sources. For instance, total fuel use for an area can be obtained from state tax records, total dry cleaning emissions can be determined from population figures, and emission factors can be obtained from AP-42.

Obviously, the extent to which an agency can check the responses depends on the resources available to the agency.

Nevertheless, the success of the questionnaires will suffer greatly if the accuracy of the responses is not properly checked. Provisions for the resources, funds, and manpower needed to check the questionnaires should be established by the agency at the onset of the inventory.

The return rate can be greatly increased by recontacting delinquent recipients by phone or letter. Recontact reminds them they will not be conveniently forgotten if they just remain quiet. For others, who may be frustrated with the questionnaire, it provides an honorable way to ask for help. A sample follow-up letter to a delinquent recipient is given in Appendix D.

A contact at the recipient's facility, preferably the person who filled out the questionnaire, is also important to help the agency clarify or substantiate responses in the questionnaire.

The number of contacts with the recipient should be limited because the recipient might become uncooperative if continually requested to supply information. This is particularly true for those who might be annoyed by the entire idea of completing a questionnaire. Limited contact, however, does not mean that the agency should refrain from recontacting a recipient whose questionnaire is incomplete or improperly completed. When recontacting a recipient, though, the agency should attempt to ask for all required information at one time.

Finally, the agency should observe the successes and shortcomings of its questionnaire. Causes should be established from any problems incurred so that the next questionnaire can be improved.

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APPENDICES

Appendices A, B, C, & D contain sample cover letters, instruction pages, question sections, and a follow-up letter. They are intended only as illustrations of suggestions made in the text, not as prototypes to be copied exactly.

No attempt has been made to provide any one complete questionnaire for a particular purpose. Each agency should compile its own questionnaire according to its own needs.

Some of the examples included here have been taken directly from actual questionnaires distributed by state agencies. Others have been altered somewhat or designed solely for this document. All examples have been denuded of identifying marks and names to protect the privacy of the contributors.

In some instances the examples have been reduced from larger size originals to make inclusion in this document convenient. In any actual questionnaire, care must be taken to assure that space for answers is adequate and that pages do not appear cramped.

Appendix E contains sample entries from AP-42 to illustrate the kinds of information that can be obtained from it and sample forms from the National Emissions Data System (NEDS) to illustrate uses for the information obtained from an emissions inventory.

APPENDIX A

Example Cover Letters

A-2: Sample cover letter

A-3: Cover letter explaining applicability

A-4: Cover letter with general instructions

A-5: Cover letter with general instructions

(OFFICIAL STATIONERY HEADING)

LAWS OF THIS STATE REQUIRE THAT THE INFORMATION REQUESTED BELOW
BE SUBMITTED AS SPECIFIED TO THE (AGENCY).
FAILURE TO RESPOND COULD RESULT IN
(LOCALLY APPLICABLE REGULATIONS OR PENALTIES)

Gentlemen:

The (agency) is conducting an inventory of atmospheric emissions of organic compounds from stationary sources in (area). The results will be used in the formulation of control plans as required by (applicable regulations). You are requested to provide information necessary for the assessment of emissions from equipment and processes in your plant by completing the enclosed questionnaire.

Confidentiality will be provided for all submitted information (other than emissions data) which is properly identified as confidential on the answer sheet.

This questionnaire has been designed specifically for your industry; therefore, you should answer each question.

The required data should be submitted no later than thirty (30) days after receipt of this letter. A return envelope is included for your convenience.

Any questions regarding this questionnaire should be forwarded to (name(s) of Agency personnel) at (phone number).

Sincerely,

(Name)
(Title)

(OFFICIAL STATIONERY HEADING)

YOU ARE RESPONSIBLE FOR PROVIDING THE INFORMATION REQUESTED BELOW FOR THE CALENDAR YEAR (YEAR) NO MATTER WHAT PORTION OF THE YEAR YOU OPERATED AND/OR OWNED THE FACILITY OR HOW SMALL YOUR SOURCE OF EMISSIONS. FAILURE TO COMPLY MAY BE GROUNDS FOR THE INSTITUTION OF LEGAL PROCEEDING IN ACCORDANCE WITH THE PROVISIONS OF (STATUTE), WHICH PROVIDES FOR CIVIL PENALTIES IN THE EVENT OF VIOLATION.

Gentlemen:

A primary responsibility of the (Agency) is to evaluate the quality and quantity of the air contaminants emitted to the atmosphere of (area). The attached solvent usage survey report forms will assist the (Agency) in carrying out that important task.

The questionnaire which follows is a general questionnaire, some parts of which will not be applicable to your situation. You are requested to complete one form for each item of equipment you have which is listed below. You will also complete one pink form number 4 for each location. All pages which are not applicable are to be marked as such in the space provided at the top of each page.

WHITE	FORM 1 - Spray Booths (paint & Solvents) Degreasers (metal cleaning) Dip Tanks (painting & cleaning) Printing Presses (ink & solvents) Roller or Flow Coaters (paints & solvents) Adhesive & Miscellaneous equipment (solvents)
YELLOW	FORM 2 - Ovens (used to dry coated materials)
BLUE	FORM 3 - Bulk handling and processing equipment which use solvents. (Paint, plastic, fertilizer, pharmaceutical, insecticides, rubber, preservatives, etc.)
PINK	FORM 4 - Each plant location (solvents & cleaning)

Please give the permit number if the equipment has one. If the equipment does not have a permit, write in Section A of the form "No Permit".

The required data is to be submitted not later than thirty (30) days after receipt of this questionnaire. We will be glad to assist you in any way that we can. If you have any questions, please contact (Name(s) of agency personnel) at (phone number).

Sincerely,

(Name)
(Title)

(OFFICIAL STATIONERY HEADING)

THIS SURVEY IS IN ACCORDANCE WITH (REGULATION). YOU WILL BE LIABLE FOR (PENALTY) IF YOU DO NOT COMPLY.

Dear Sir:

The purpose of this survey is to obtain information on the approximate number of gallons of gasoline which are delivered at selected service stations. Neither the name or location of your station will be disclosed in any survey report.

Results will be reported for the total number of stations in each category. For example, six stations in the lower end of the range (approximately 100,000 gallons/year); eight in the middle range and six in the upper range (over 500,000 gallons/year).

You will receive a copy of this final survey and should find it useful both for scheduling of your own personnel and for comparison of your individual deliveries against the norm for your range.

We appreciate that your sales are heaviest on the weekends, so please take your readings on a Tuesday, Wednesday or Thursday during the month of (month).

Special Notes

1. Please take the reading on each pump once every two hours, preferably near the end of the even hours. If for some reason you are unable to take the reading at the scheduled time, skip the reading and take it for the next hour, noting the time.

2. Numbered labels are provided so that you can number your pumps for the purpose of this survey.

3. The form contains columns for six pumps; if you have more than this, please use additional sheets.

4. The completed form is to be returned to this office by (Date). A self-addressed, stamped envelope has been enclosed for your convenience.

Sincerely,

(Name)
(Title)

(OFFICIAL STATIONERY HEADING)

FAILURE TO RESPOND TO THIS REQUEST COULD CAUSE
(LOCALLY APPLICABLE REGULATIONS OR PENALTIES)

Gentlemen:

The (Agency) requests your cooperation in providing the information asked for on the attached questionnaire concerning potential emissions resulting from the operation of your facility. The results will be used in compiling a state-wide analysis of your industry.

BEFORE FILLING OUR THE QUESTIONNAIRE
PLEASE READ THE FOLLOWING INSTRUCTIONS:

- Please return the questionnaire in the enclosed stamped, addressed envelope on or before (Date). Your cooperation and expeditious completion of the inventory forms will be appreciated.
- The questionnaire was designed for a wide variety of operations which involve extensive solvent usage. Accordingly, many questions may not apply to your facilities. Please complete only those sections that are applicable to your operations and mark the others as "not applicable."
- Everyone receiving this form should complete Section I (General Information). Indicate any change in name and/or address.
- The information submitted should pertain to the calendar year of (Year).
- If there is more than one plant location, please request additional copies or photocopy it for each facility.
- If the space provided is not adequate, feel free to either copy the form, use a separate sheet or request an additional copy.
- Please mark clearly any information, other than emissions data, which you consider confidential and include your reasons for doing so in your cover letter.

Your cooperation in filling out this form is greatly appreciated. If you require additional forms or further information, please contact (Name of Agency contact) (telephone).

Sincerely,

(Name)
(Title)

APPENDIX B

Example Instruction Sheets

B-2: Sample general instructions

B-3: Special instructions

B-4: Instructions for computer-formatted form

B-5: Plant lay-out map and process flow diagram instructions for less complex industries

B-6 to B-10: Plant lay-out map and process flow diagram instructions for more complex industries and sample.

(SAMPLE)

GENERAL INSTRUCTIONS

ORGANIC SOLVENT SOURCE QUESTIONNAIRE

1. All questions should be directed to (name of agency contact) (phone number).

2. This questionnaire was designed to obtain information from a wide variety of solvent users. The complete questionnaire includes the following pages:

   Page A - General Information
   B - Degreasing Operations
   C - Dry Cleaning Operations
   D - Protective or Decorative Coatings
   E - Fabric or Rubberized Coatings
   F - Miscellaneous Surface Coatings
   G - Ovens
   H - Printing
   I - General Solvent Use
   J - Bulk Solvent Storage
   K - Control and Stack Information

   You have received only the pages that our records show would pertain to your operations. All recipients should complete pages I, J. and K. If certain pages appear to be missing please contact (name of agency contact).

3. Data should reflect calendar year (year) or (year), whichever is more readily available. Specify any other 12-month period that may be used.

4. Fill in the descriptive information and amounts of solvent use or solvent containing materials for <u>each device</u> operating under county permit as shown in the example on each page. (Note: these examples are for illustration only and may not represent actual operating conditions.) If data are not available on an individual device basis, use best estimates from total plant usage.

5. If the type(s) and/or percentages of solvents in coatings, inks, etc. are not known, include sufficient information on the manufacturer, type and stock number so that this breakdown can be obtained. A copy of the supplier's invoice would be adequate. <u>Do not</u> simply specify that the material meets Rule 66 requirements.

6. Confidential or proprietary information may be so specified by including a cover letter with the returned questionnaire. The data that will be generated during this program will be public information. However the data on specific sources will be presented in a manner that will conceal the individual emission source to all but staff personnel. It is our understanding that the data will not be used for enforcement purposes; however, it must be recognized that this information may be employed in the formulation of regulations which may ultimately affect the specific sources included in the study. Again, please specify in writing what data are considered confidential or proprietary.

SPECIAL INSTRUCTIONS

(AGENCY) EMISSIONS INVENTORY QUESTIONNAIRES ARE MAILED TO ALL INDUSTRIES WHETHER LARGE OR SMALL. IT IS EXPECTED THAT MANY SMALL INDUSTRIES WILL BE EXEMPT FROM FUTURE QUESTIONNAIRES. HOWEVER, EXEMPTIONS CAN BE GRANTED ONLY AFTER THE (AGENCY) HAS COMPLETED AN EVALUATION OF THE COMPANY'S FACILITIES. THEREFORE, IT IS IMPORTANT THAT SMALL INDUSTRIES COMPLETELY DESCRIBE ALL OPERATIONS ON PAGE ( ). IF NECESSARY, A LETTER SHOULD BE ATTACHED FULLY EXPLAINING THE COMPANY'S OPERATIONS. INADEQUATE INFORMATION WILL RESULT IN CONTINUED COMMUNICATIONS FOR ADDITIONAL INFORMATION.

INSTRUCTIONS FOR COMPLETING THE SOLVENT USAGE SURVEY FORMS

These forms are formatted for computer input. Therefore, it is essential that all answers be entered properly.

When an answer is in words, such as the name of your facility, begin with the left box and write your answer one letter to a box until you finish or run out of boxes. Use standard abbreviations, if necessary.

When your answer is in numbers, such as the amount of solvent used, put the last digit of the number in the box farthest to the right and work backwards. Round off any fractions to the nearest whole number. For example, enter 2785.8 gallons as

[ ][2],[7][8][6] gal.

The forms require that you enter the operating time using a 24-hour clock. Use the following table to convert from normal clock time. Round each time to the nearest whole hour; round half hours to the previous hour.

Normal Clock	24-Hour Clock	Normal Clock	24-Hour Clock
12 Midnight	00	1 p.m.	13
1 a.m.	01	2	14
2	02	3	15
3	03	4	16
4	04	5	17
5	05	6	18
6	06	7	19
7	07	8	20
8	08	9	21
9	09	10	22
10	10	11	23
11	11	12 Midnight	24
12 Noon	12		

For a beginning time of 8:30 a.m. and an ending time of 4:45 p.m., round off 8:30 to 8:00 and 4:45 to 5:00. Using the table, convert 8:00 a.m. to 08 and 5:00 p.m. to 17. Enter these numbers on the form as follows:

Beginning Time [0][8]

Ending Time [1][7]

A 24-hour operation would be entered as:

Beginning Time [0][0]

Ending Time [2][4]

INSTRUCTIONS FOR REPORTING
EMISSION SOURCES AND NEW PROCESSES

INFORMATION PROVIDED SHOULD BE FOR THE CALENDAR YEAR (JANUARY 1 THRU DECEMBER 31)

PLANT LAY-OUT MAP AND SOURCE NUMBERING

A scaled map of your plant showing boundaries must be included with your questionnaire. Number each source of emissions to the atmosphere (stack, flare, building, dump, etc.) sequentially throughout the plant so that no two emission sources have the same number. These numbered emission sources will be used throughout the questionnaire and will be referred to as "SOURCE NUMBERS." If a scale map was previously provided, supply a sketch so we can locate any new emission sources on your map.

PROCESS FLOW DIAGRAM

A flow sheet should be provided for each manufacturing process, fuel combustion, and waste disposal system:

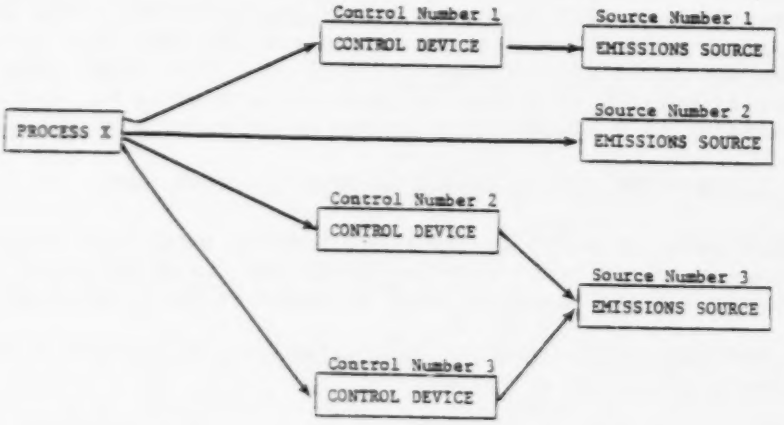
1. Draw a flow diagram similar to the example below that describes the flow of emissions from each contributing source.

2. Name each"PROCESS." The process name should be descriptive and indicate the type of equipment used in the process.

3. Label each air pollution control device with its "CONTROL NUMBER" and label each source of emissions with its "SOURCE NUMBER."

The "SOURCE NUMBERS" in the Process Flow Diagram should be identical with those listed in the PLANT LAY-OUT MAP and throughout the QUESTIONNAIRE.

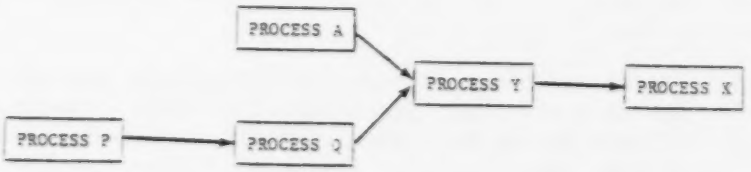
EXAMPLE:



OVERALL PLANT FLOW PATTERN

A diagram describing the interrelationships of the process within your plant should be compiled similar to the example below and included with the returned questionnaire (name each process with the same name used for the "Process Flow Diagram"). Flag new processes and indicate their interrelationships with previously existing processes:

EXAMPLE:



PLOT PLAN GUIDELINES

In order to accurately define the geographical coordinates of each emission point for computer modeling, the agency must use computerized aids to determine the exact location of your emission sources with respect to an accurately defined bench mark location. It is important, therefore, that your plot plan conform to the following specifications:

1. The plot plan should be drawn with a scale between 1" = 10' and 1" = 400'. The plot plan submitted should not be reduced or enlarged from the original scale drawing. The maximum size plan should be 30" x 40".

   If your plant is too large to meet the above criteria submit multiple drawings, each in accordance with these guidelines and each with an accuratley defined bench mark.

2. One point on each plot plan map should be specified as the plant's bench mark by latitude and longitude accurate to the nearest degree, minute, and second (General Highway Maps from the State Highway Department or U.S. Geodetic Survey maps available from local engineering supply offices have latitude and longitude lines on them and may be an aid in determining this). This point does not necessarily have to be within the plant's boundaries but could, for example, be a nearby intersection which appears on the plot plan.

3. A "TRUE NORTH" arrow should be drawn on each plan.

4. Each emission point in the plant must be accurately placed with respect to the bench mark and should be designated with a dot. Numbered flags should be used to identify these emission points.

5. Since these data will be computerized, we ask that you use emission points uniformly as follows:

   A. Use only numbers and upper case letters.

   B. Do not use more than 8 characters.

   C. Do not use the same number for two different emission points. If you have a stack number 2 and tank number 2, use S2 and T2 to differentiate between them.

   D. Numbers for fugitive emission points should include the prefix "F."

   E. Please be consistent with emission point numbers between the plot plan and the emissions inventory questionnaire. If emission point numbers can not correspond to those in your last emissions inventory, please provide a cross-reference table.

6. An emission point number should be assigned for each of the following items:

   A. Any stack or vent which normally has a flow containing compounds other than steam or oxygen.

   B. Each flare (ground or elevated).

   C. Each industrial tank greater than 10,000 gallons which contains a volatile organic compound (VOC) regardless of vapor pressure and each tank between 1,000 gallons and 10,000 gallons which contains VOC with a vapor pressure $\geq$0.1 psia, at storage temperature, which vents to the atmosphere. Tanks less than 1,000 gallons which contain material of <u>any</u> vapor pressure may be grouped together and their emissions represented under a tank farm fugitive emission point number along with the emissions from the valves and pumps in the tank farm.

   D. Each loading/unloading point (for railroad cars, trucks, pipelines, ships, and barges).

   E. Each fugitive emission point:

      a. Each process which has groups of non-continuous stacks or vents (i.e., relief valves, blowdown vents, rupture disks), process drains, pipe valves and flanges, pump seals, compressor seals, or raw material transfer points which are sources of fugitive materials. Each process should have one fugitive emission point number assigned.

      b. Each cooling tower structure which cools water that has exchanged heat with process hydrocarbons (several bays in one structure may be represented by one emission point number). Closed circuit cooling water systems which have a vent on the water surge vessel are considered fugitive emission sources and an emission point number must be assigned to each vent.

      c. Each pond, reservoir, lagoon, holding basin, separator, or other containment containing any carbon compound in process waste water. Fresh water, fire water, and inorganic chemical water ponds need not be assigned emission point numbers.

d. Each open burning area or open dump; each bulk materials and solid waste storage pile.

e. Any other fugitive emission for a given area of the facility of which you have knowledge (i.e., painting, degreasing, engine testing, space heating, printing, etc.)

7. Identification of many singular emission points may be difficult in congested areas of some plot plans.

   Reference numbers or letters may then be used to identify a group of these emission point numbers. We ask that you do not group these congested emission points unless they are within 30 feet of the selected point shown on the plot plan. This 30-foot rule applies only to stacks and does not apply to groupings of fugitive emissions for an area; e.g., valves, pumps, and small tanks within a VOC storage tank farm.

8. Combustors of the same type and which have a unit design capacity less than one million BTU/hr may be grouped under one emission point number. That is, all small heaters in your plant can be grouped and assigned one emission point number. All small boilers can also be grouped and assigned another emission point number. Therefore, only two dots would be drawn on your plot plan to represent these two groupings. The location of these points must be representative of the area in which the majority of the stacks are located.

9. Place your Plant ID number on the plot plan. This number is located in the lower left corner of the address label on the questionnaire.

EMISSION INVENTORY SHORT FORM QUESTIONNAIRE INSTRUCTIONS

1. Complete each applicable item and return the questionnaire within 60 days after receipt. Indicate "NA" for the items in the questionnaire not applicable to your operation.

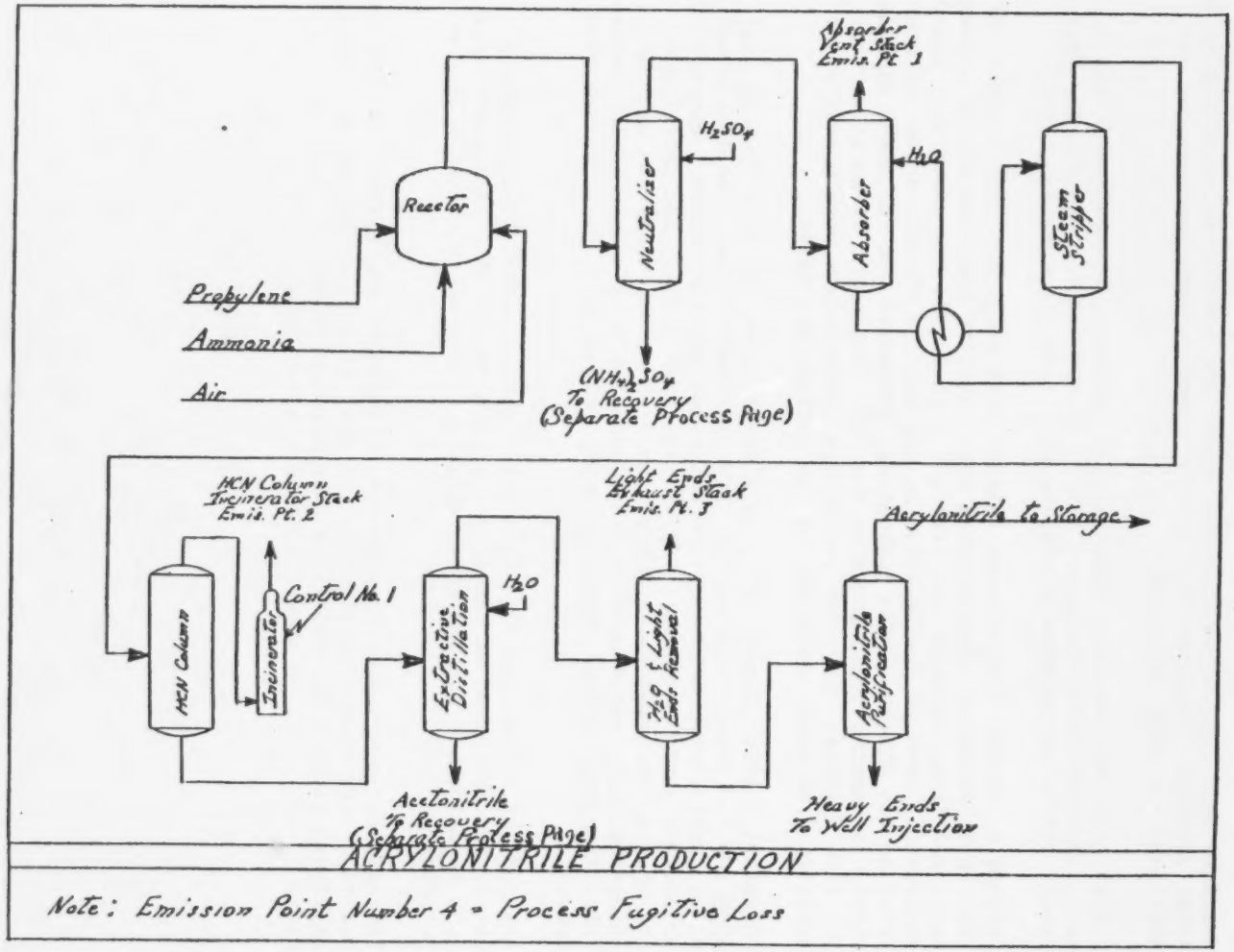
2. Unless your questionnaire specifically indicates a requirement for estimated emission rates (tons per year), do not enter these rates. Emission rates will be calculated by the (Agency) from the data submitted.

3. Include a process flow diagram (sample attached), for each process, with your questionnaire. This diagram must indicate the flow of raw materials and fuels into, through, and from the process and its associated process equipment. Each of the emission points must be clearly shown and numbered on the diagram. The combustors, processes and abatement equipment should be descriptively named on the flow diagram or on an attachment to the flow diagram. Emission points are those points within your plant property from which emissions to the outside air exist.

4. An Emission Point Number (EPN) is also required for each Process Fugitive loss and for fugitive emissions from aggregate or solid waste storage piles, waste water holding ponds which may contain carbon compounds and volatile organic compound (VOC) storage tank farms. The latter must show not only an emission point number for each storage tank and each loading/unloading dock, but also a fugitive emission point number which represents the total losses from all pumps, valves, etc. in each tank farm area.

5. All roof or other building vents not directly ducted from processes are to be considered as building fugitive emissions. Assign one emission point number for the total emissions from all such vents in one building.

6. Process stacks which go through the building or are against it, but do not rise more than 10 feet above the roof line or apex, are considered as "Short Stacks" for emissions dispersion modeling and must be so indicated in the stack data section of the questionnaire.



SAMPLE PROCESS FLOW DIAGRAM

APPENDIX C

EXAMPLE QUESTION SECTIONS

GENERAL INFORMATION

C-2: Identification and Question Sheet Section
C-3: Identification
C-4: Location
C-5: Location
C-6: Fuel Consumption
C-7: Refuse Collection and Disposal
C-8: Refuse Disposal

SPECIFIC INDUSTRIAL PROCESS

C-9: Stack Data
C-10 to
C-11: Elevators, Grain Processing, Feed Emissions
C-12: Computerized Solvent Survey
C-13: Computerized Solvent Survey
C-14: Heat, Steam and Power Equipment
C-15: Boiler Design
C-16: Electric Power Plan
C-17: Stone Quarrying, Rock Processing, and Mixing
C-18 Concrete Batching
C-19 to
C-20: Grain Operations
C-21: Storage Tank Data
C-22: Process-Weight
C-23: Emission Sources
C-24: Emission Data

SPECIFIC AREA SOURCE

C-25 to
C-26: Petroleum Storage and Handling
C-27 to
C-28: Dry Cleaning

POLLUTANT-SPECIFIC

C-29: Toxic and Hazardous Materials
C-30: Elements and Compounds Emitted
C-31: Lead Emissions Inventory

I. General Information

A. (Sic Number) (ID Number) _____

(Facility Name) _____

(Facility Address) _____

(City, State) (Zip) _____

If any of the information on the mailing label at left is incorrect, please provide the correct information in the corresponding blank to the right.

B. Person to contact about form_____

Telephone_____ Title_____

C. Are solvent-containing materials such as cleaning fluids, coating, adhesives, ink, etc. used at your facility?

_____Yes

_____No

If no, sign this form and return it.

If yes, sign this form and complete only the sections which apply to your facility:

		Page
II.	Dry Cleaning	2, 9 & 10
III.	Degreasing	3, 9 & 10
IV.	Surface Coating & Applications	
	A. Fabric and Rubberized	4, 9 & 10
	B. Protective or Decorative other than IV-A	4, 9 & 10
	C. Printing	6, 9 & 10
	D. Miscellaneous Surface Coatings (Adhesives, Paper, Leather, Films, Glass, etc.)	7, 9 & 10
V.	Manufacturing Industries	8, 9 & 10

Signature_____ Date_____

A. The manager of the facility, on location at the plant site:

Name: _____

Title: _____

Name of Company: _____

Business street address/P. O. Box: _____

City or town, parish, Zip code: _____

Business area code/telephone No. _____

B. Person to contact at the site of the facility about air pollution control, if different from the above:

Name: _____

Title: _____

Business telephone No./extension: _____

C. If the company's air pollution control correspondence and documents are prepared at a headquarters office, at a different site, give the information on the person to be contacted below:

Name: _____

Title: _____

Name of company; or parent company: _____

Business street address/P.O. Box: _____

City, state, Zip code: _____

Business area code; telephone No: _____

D. Person who prepared this report: (If one of the above, just check appropriate block: ☐ A. ☐ B. ☐ C.

Name: _____

Title: _____

Firm: (if prepared by a consultant) _____

Company:(if prepared in-house) _____

Street address/P.O. Box: _____

City, state, Zip code: _____

Area code, telephone #, extension: _____

_____
(signature of manager, or other company agent)

_____
(printed or typed name & title of person above)

_____
(date signed)

Please supply the location of your plant in one of the following three coordinate systems:
Please supply UTM or latitude-longitude coordinates if possible, otherwise use County-Township-Section-Range (CTSR) coordinates.

UTM COORDINATES	LATITUDE-LONGITUDE COORDINATES	CTSR COORDINATES
Horizontal_____KM	North Lat.____Deg:____Min:____Sec.	County_____
Vertical_____KM	West Long.____Deg:____Min:____Sec.	Township_____
		Section_____
		Range_____

The above location information may be obtained from county records. Please include enough information to enable us to plot your plant location within 0.1 mile. Attach a simple sketch of distances and directions from an incorporated municipality along any numbered highway.

Industrial sources are required to include a detailed plant layout. Use constant identification system for emission sources in questionnaire and plant layout.

PLANT LOCATION FOR AIR POLLUTION DISPERSION MODELING

Give below the Universal Transverse Mercator zone number and Universal Transverse Mercator (UTM) coordinates, to the nearest one-tenth kilometer, of your facility. These will be used for wide area dispersion modeling purposes.

The coordinates can be obtained from most U.S. Geological Survey maps, scale 1:24,000 or 1:62,000 for your particular area. These maps, if not already in your possession, may be found in your local library, or can be purchased from the U.S. Geological Surgey (USGS) at the address shown below. An index of all the maps available for (area), together with prices and detailed instructions for ordering, may be obtained free by addressing a request to:

U.S. Geological Survey, Distribution Center, Denver Federal Center, Bldg. 41, Denver, Colorado 80225

If the map has the Universal Transverse Mercator (UTM) coordinates listed, it will have the UTM zone number mentioned among the writing along the bottom of the map.

Please note: Latitude and longitude are not what we need. The USGS maps do not show UTM grid lines as they do latitude and longitude; however, tick marks along the edges of the maps do indicate the UTM grid locations. A straight edge must be used to connect tick marks at the opposite sides of USGS maps when interpolating between UTM tick marks. The map grid is drawn on the latitude-longitude system and, therefore, the UTM grid may appear quite skewed. For the scales mentioned, tick marks appear for every 1000 meters (1 kilometer), with every fifth tick mark and the tick marks nearest the southeast and northwest corners of the map giving the value in meters. The 1:24,000 scale is preferred to accurately locate the facility, but the 1:62,000 scale may be used if the 1:24,000 scale map is unavailable for your area.

For example: The state capitol building would be:

UTM zone No. (_ _) horizontal coordinate: (_ _ _ _)Km.E
vertical coordinate: (_ _ _ _ _) Km.N

Your facility: UTM zone No.(_ _) horizontal coordinate: (_ _ _ _) Km.E
vertical coordinate: (_ _ _ _ _) Km.N

TOTAL FUEL CONSUMPTION: (Not applicable_____)

Type of Unit	Natural Gas (Thousands of Cubic Feet)/Yr	LPG (Gallons)/Yr	Coal			Other Fuel		
			Tons/yr	% Ash	% Sulfur	Type	Quantity	% Sulfur
Space Heating								
Process Heaters								
Boilers								
Stationary Gas Engines								
Gas Turbines								
Other (Specify)								
Totals Consumed								

REFUSE COLLECTION AND DISPOSAL (Not applicable_____)

A. Amount of combustible refuse disposed of per year:

_____
(give the applicable units)

B. Description(s) of refuse:

☐ Paper scrap ☐ Rubber scrap

☐ Wood scraps & sawdust ☐ Wet garbage or animal wastes

☐ Other, specify:_____

C. Method(s) of refuse disposal:

☐ City pickup ☐ On-site dump ☐ On-site incineration

☐ Contractor pickup ☐ On-site outdoor burning ☐ On-site landfill

☐ Other, specify:_____

D. If disposal is by contractor pickup, give the name and address of the contractor:

_____

_____

E. The on-site incinerator, if any, has the following design features:

☐ No on-site incinerator ☐ Afterburners ☐ Water scrubber installed

☐ Single chamber ☐ Primary & secondary ☐ Waste material disposed of

☐ Multiple chamber ☐ Burners installed ☐ By burning in a boiler

F. Incinerator equipment data (if applicable):

Manufacturer:_____ Model:_____

Capacity:_____ Installation date:_____

Auxiliary fuel used:

Type_____

How used_____

Rate of use_____

REFUSE DISPOSAL

1. Is all refuse hauled off-site? Yes___ No___ If yes, disregard this page.

2. Give the approximate percentage of each type of refuse: waste paper___%, wood scrap___%, sawdust___%, garbage___%, industrial waste___%, salvage___%, plastic___%, liquid (specify): _____, ___%, other (specify):_____, ___%.

3. Check method of disposal and give quantities:

Source * Number		Quantity				Combustion Schedule	
		Yes	Lbs/hr	Lbs/day	Tons/yr	Hours/day	Days/Year
	Open burning dump						
	Single chamber incinerator						
	Multiple chamber incinerator						
	Conical metal burner						
	Burned in boiler or furnace						
	Sanitory landfill						
	Other - specify:						

4. Refuse combustion equipment:

Source Number	Incinerator Description (Manufacturer and Model Number)	Type of Aux. Fuel Used	Quantity of Aux. Fuel Per Year (Specify Units)	Control Equipment	
				Type of Device (Specify)	% Efficiency Rated Oper.

*The source numbers should match those used on your plant layout map.

This page is to be used to record the data from one stack (or other emission point) only. Photocopy this page as many times as there are individual emission points, and use one page for each point. Circled numbers refer to explanatory notes on the instruction page. If this page is not applicable to your facility, check here _____ .

① Point source ID number	Descriptive name of the equipment served by this stack	② Height of stack above grade ft	③ Stack diameter ft	Stack gas exit temperature °F

Stack gas flow rate at process conditions, not at standard ft^3/min	Stack gas exit velocity ft/sec	④ If this stack serves a "boiler", give the type(s) of fuel used and the heat input (i.e, fuel rate x heating value) _____ type(s) of fuel _____ 10^6 BTU/hr 1st fuel _____ 10^6 BTU/hr 2nd fuel, if any	% of annual throughput of pollutants through this emission point (totals 100%) Dec-Feb %	Mar-May %	June-Aug %	Sept-Nov %	Normal operating time of this point hrs day	days week	wks yr

Name of pollutant	⑤ Pollution control equipment code	⑥ Control equipment efficiency	Average emission rate lbs/hr	Maximum emission rate lbs/hr	Annual emission rate tons/hr	⑦ Emission estimation method	⑧ Add, change or delete code	⑨ Concentration in gases exiting the stack gr/std ft^3 PPM (VOL)
particulate matter								
sulfur dioxide								
nitrogen dioxide								
⑩ hydrocarbons								
carbon monoxide								
lead								

Fill in this column only as required by note 9.

If this stack is from equipment which burns fuel, give the % of the total fuel used by the equipment which is used, either directly or indirectly, for space heating (or cooling) at the plant. (i.e., to heat or cool the air in a room) If this stack is not from a fuel burning equipment, or if fuel is burned but none of the heat is intended to heat or cool air in a room, enter a zero below:

_____ % "space heat"

Give below the fuel or process materials charging rate to the unit served by this stack. ⑪

Name of fuel/process material	Annual rate	Maximum hourly rate
	_____ /yr	_____ /hr
	_____ /yr	_____ /hr
	_____ /yr	_____ /hr
	_____ /yr	_____ /hr
	_____ /yr	_____ /hr
	_____ /yr	_____ /hr

Emissions Inventory

Account Number _____ Data for year _____ OFFICE USE ONLY

Name _____ SIC _____

Not applicable_____

ELEVATORS – GRAIN PROCESSING – FEED

ELEVATORS: Country ____ Terminal ____ Operating Rate: ____ % of Maximum Operating Schedule: ___ Hrs/Day ___ Days/Wk ___ Wks/Yr

Corn Cleaner: ___ Yes ___ No

Conveying Belts	Number of Transfer Points	Check Type of Dryer
Tunnel		Baffle __ Column __
Gallery		Screen ___
Marine		Rack ___

EPN	Grain Type	Operation	No. of Legs	Quantity of Grain (tons)	Control Equipment				Energy Used	
					Type	Eff (%)	Date Installed	Total Cost	Quantity	Units

GRAIN PROCESSING: Operating Rate: ___ % of Maximum Operating Schedule: ___ Hrs/Day ___ Days/Wk ___ Wks/Yr

EPN	Grain Type	Operation	Quantity (tons)	Control Equipment			STACK DATA				
				Type	Eff (%)	Date Installed	Height Above Ground (ft)	Inside Diameter at Exit (ft)	Temp (°F)	Short Stack ?	Velocity (ft/sec.)

AUTHORIZING SIGNATURE _____ Name of Contact Representative _____ Telephone (A. C.) _____

Elevators, Grain Processing-Feed: (Continued)

FEED MANUFACTURING: Operating Rate: ____ % of Maximum Operating Schedule: ____ Hrs/Day ____ Days/Wk ____ Wks/Yr

EPN	Grain Type	Operation	Quantity (tons)	Control Equipment			Height Above Ground (ft)	Inside Diameter at Exit (ft)	Temp (°F)	Short Stack (✓)	Velocity (ft/sec)
				Type	Eff (%)	Date Installed					

Plant Location: (Deg., Min., Sec.)___:___:___ North Latitude ___:___:___ West Longitude
Permit Numbers since January 1977:_____

Describe all non-permitted changes to your operation since January 1977, e.g., added a cyclone to unloading area (EPN - 1). Make additional copies of this questionnaire as needed.

BLUE COPY

FORM [3] (1) SOLVENT SURVEY FOR BULK PRODUCT HANDLING & PROCESSING EQUIPMENT WITH A PERMIT

I.D. NUMBER (2–8) COMPANY NAME_____ COUNTY_____

EQUIPMENT ADDRESS_____ CITY_____

Subscript Numbers for Keypunch Use Only. Repeat Cols. 1-14 for All Subsequent Cards. Card No. in Col. 80 i.e. 1, 2, 3 etc.

A

Please copy the Permit (PERM.NO.) (9–14) and Application (APPL.NO.) (15–20)

exactly as shown on the address sheet.

B

IF THIS EQUIPMENT WAS NOT USED LAST YEAR, CHECK THIS BOX [ ] (21) OR IF THIS EQUIPMENT HAS BEEN REMOVED, CHECK THIS BOX [ ] AND COMPLETE SECTION "F" ONLY.

IF THIS EQUIPMENT WAS USED AT LEAST FIVE (5) DAYS IN THE LAST YEAR, COMPLETE FORM

C

USE A SEPARATE SHEET FOR EACH PERMIT.

TOTAL AMOUNT OF LIQUID ORGANIC MATERIAL EMITTED FROM THE EQUIPMENT, OR ADDED TO PRODUCT FOR 1975 (23–29) LBS/YEAR

PLEASE CONVERT ALL VALUES TO LBS/YEAR

TOTAL AMOUNT OF LIQUID ORGANIC MATERIAL SHIPPED AS A PART OF THE PRODUCT. (30–36) LBS/YEAR

D

IF THE EQUIPMENT WAS VENTED TO ONE OR MORE CONTROL DEVICES, PLEASE ENTER THE PERMIT NUMBERS BELOW AND THE BTU/HOUR RATINGS IF THE CONTROL DEVICES WERE AFTERBURNERS.

CONTROL PERMIT NO. (37–42) FOR AFTERBURNERS (43–47) 000 BTU/HR

CONTROL PERMIT NO. (48–53) FOR AFTERBURNERS (54–58) 000 BTU/HR

CONTROL PERMIT NO. (59–64) FOR AFTERBURNERS (65–69) 000 BTU/HR

E

AVERAGE DAILY HOURS FOR PRODUCT MANUFACTURE IN 1975

USE 1ST TWO DIGITS ON 24 HOUR CLOCK CARD 2

	MON.	TUES.	WED.	THURS.	FRI.	SAT.	SUN.
BEGINNING TIME:	21	23	25	27	29	31	33
ENDING TIME:	35	37	39	41	43	45	47

*SEE INSTRUCTION SHEETS

NUMBER OF WEEKS PER YEAR EQUIPMENT WAS OPERATED: (49)

F

PERSON SUPPLYING INFORMATION_____ TITLE_____

PHONE_____ SIGNATURE_____ DATE_____

AFTER COMPLETING THE APPLICABLE SECTIONS, RETURN THIS SHEET TO THE (AGENCY).
IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT (NAME, PHONE OF AGENCY CONTACT).
WE THANK YOU FOR YOUR COOPERATION.

PINK COPY

FORM 4

SOLVENT USAGE FOR SOURCES WHICH DO NOT HAVE APCD PERMITS
COMPLETE ONE FORM FOR EACH PLANT LOCATION

COPY IDENTIFICATION NUMBER EXACTLY FROM ADDRESS LABEL

I.D. NUMBER (2–8)

COMPANY NAME _____ COUNTY _____

EQUIPMENT ADDRESS _____ CITY _____

Subscript Numbers for Keypunch Use Only.

A IF YOU DID NOT USE ANY LIQUID ORGANIC MATERIALS IN THE YEAR 1975, CHECK THIS BOX ☐
COMPLETE SECTION "C" AND RETURN THIS FORM.

B LIST THE TOTAL AMOUNT OF ANY AND ALL LIQUID ORGANIC MATERIALS USED AT YOUR LOCATION WHICH ARE NOT IDENTIFIED WITH EQUIPMENT HAVING A PERMIT TO OPERATE. DO NOT INCLUDE ANY SOLVENTS OR THINNERS THAT HAVE BEEN INCLUDED ELSEWHERE ON ANOTHER SURVEY SHEET. ENTER THAT TOTAL BELOW FOR 1975.

☐☐☐☐☐☐ ~~LBS~~ YEAR (9–15)

PLEASE CONVERT ALL VALUES TO LBS/YEAR

IDENTIFY THE MAJOR USES THAT THE LIQUID ORGANIC WAS USED FOR (FOR EXAMPLE-CLEAN UP, MAINTENANCE, THIN PAINT ETC.) BELOW.

		APPROXIMATE % OF TOTAL USED
1	CLEAN-UP	☐☐ % (16)
2	MAINTENANCE	☐☐ % (18)
3	THINNING PAINT	☐☐ % (20)
4	ALL OTHER USES	☐☐ % (22)

USE ADDITIONAL SHEETS IF NECESSARY

C PERSON SUPPLYING INFORMATION _____ TITLE _____

PHONE _____ SIGNATURE _____ DATE _____

D AFTER COMPLETING THE APPLICABLE SECTIONS, RETURN THIS SHEET TO THE (AGENCY).
IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT (NAME, PHONE OF AGENCY CONTACT).
WE THANK YOU FOR YOUR COOPERATION.

HEAT, STEAM, AND POWER EQUIPMENT

(Not applicable_____)

INSTRUCTIONS: Use one line for each individual emission source. The source numbers should match those used on your plant lay-out map and in the process-weight and stack data sections.

BOILERS - Specify type of firing as tangential, opposed, front, etc.

INTERNAL COMBUSTION ENGINES - Specify the type of gas engine as V-6, V-8, V-12, Radial, etc.

Source Number	Number of Units	Approximate Size of Each Unit				Type of Fuel Used (Specify)	Quantity of Fuel Per Year (Specify Units)	Wt % Sulfur	Wt % Ash	Control Equipment		
		Boilers		Gas Engines							% Efficiency	
		Million Btu/hr Heat Input	Type of Firing	Brake Horse Power	Type					Control Number	Rated	Estimation*

*Estimation Method

1. Stack test
2. Engineering estimate
3. Design (vendor)
4. Other (specify)

BOILER DESIGN

(Not applicable_____)

COMPLETE FOR EACH BOILER: Copy this page for additional boilers

	Boiler #____	Boiler #____	Boiler #____
1. Source number (refer to plant lay-out)			
2. Year boiler placed in service			
3. Rated maximum (million Btu/hr)			
4. Extended maximum (million Btu/hr)			
5. Type of firing (tangential, opposed, front)			
6. NO_x Controls			
A. Flue gas recirculation (yes or no) (does flue gas enter directly into combustion zone)			
B. If yes, what percent?			
C. Pre-heat combustion air (yes or no)			
D. If yes, temperature of pre-heated air?			
E. Off stoichiometric combustion (yes or no)			
F. Other means (specify)			
7. Lbs. NO_x emitted/million Btu @ 100% load			

If you have some other form of electrical generation equipment, such as an internal combustion engine, enclose a full description of the equipment, including emission controls. Also include the type and monthly consumption of fuel.

ELECTRIC POWER PLANT (Not applicable_____)

FUEL FIRED TURBINES

Fuel Consumption for Each Turbine: (Copy this page for additional turbines)

Rated Horsepower_____ Source #_____ (Refer to Plant Lay-out)

Month	Natural Gas in Million CF	Distillate Oil in 1,000 Gal	Other Fuel (Specify Type and Amount)	Average Wt. % Ash	Average Wt. % Sulfur	Average Hrs. Per Day in Operation	Number of Days in Operation
January							
February							
March							
April							
May							
June							
July							
August							
September							
October							
November							
December							
Year(Total)							

Max Rated Electric Output KW

Source Number	Associated Air Pollution Control Devices	Date Installed	Pollutants Affected	Control Number	% Efficiency	
					Rated	Oper.

STONE QUARRYING, ROCK PROCESSING, AND MINING (Not applicable_____)

1. Method of rock transportation: Truck_____ Conveyor_____ Other (specify)_____
2. Distance of haul roads: Paved_____miles Unpaved_____miles
3. Quantity of raw material entering primary crushers: _____lbs/hr, and _____tons/yr (total)
4. Check process used and type of air pollution control devices used during each process:

Check Process Used		Enclosures	Cyclone	Multicyclone	Fabric Filter	Electrostatic Precipitator	Other (Specify)
Primary Crushing							
Secondary Crushing							
Tertiary Crushing							
Recrushing and Screening							
Conveying							
Drying							
Other (Specify)							

5. Describe new abatement equipment proposed: (continue on additional page if necessary)
   Type_____ Proposed Operational Date (Mo/Yr)_____
   _____ _____
   _____ _____
6. Describe all process operations at this location on Page ( )

CONCRETE BATCHING (Not applicable_____)

1. Quantity of concrete mixed during calendar year_____(cubic yards)

2. Approximate percentage use:

   On-site construction work_____%

   Pre-fab construction parts_____%

   Other (specify)_____ _____%

3. Distance of roads to and from plant: Paved_____(miles) Unpaved_____(miles)

4. Method of loading storage hopper: Conveyor_____ Bucket_____ Elevator_____ Pneumatic_____

5. Check the type of pollution control equipment:

Filters on storage bin vents	
Enclosures-dumping area	
Enclosures-loading area	
Water spray	
Other (specify)	

6. Describe new abatement equipment proposed:

   Type_____ Proposed Operational Date (Mo/Yr)_____

   _____ _____

   _____ _____

7. Describe all process operations at this location on Page ( ).

PROVIDE THE INFORMATION THAT APPLIES TO YOUR GRAIN OPERATION FOR THE CALENDAR YEAR

(Not applicable_____)

ELEVATORS:	Quantity of Grain (Tons/Year)	Number of Cyclones	Number of Filter Type Dust Collectors	Other Controls	
				Type	Number
Receiving					
Shipping					
Transferring, Conveying (Other than Receiving or Shipping)					
Screening & Cleaning					
Drying					

PROCESSING:	Quantity of Grain (Tons/Year)			Number of Cyclones	Number of Filter Type Collectors	Other Controls	
	Cleaning	Drying	Milling			Type	Number
Barley Flour							
Corn Meal							
Cottonseed							
Flour							
Malted Barley							
Milo							
Orange Pulp							
Rice							
Wheat							
Other-Specify:							

GRAIN (Continued)

MANUFACTURING OR BLENDING:	Quantity of Grain (Tons/Year)			Number of Cyclones	Number of Filter Type Collectors	Other Controls	
	Cleaning	Drying	Milling			Type	Number
Alfalfa Feed							
Barley Feed							
Corn Starch							
Cotton Seed							
Mixed Feed							
Soybean							
Other-Specify: _____ _____							

Describe new abatement equipment proposed

Type_____ Proposed Operational Date (Mo/Yr)_____ Process Affected_____

_____ _____ _____

_____ _____ _____

Check additional operations at this location: Cottonseed Oil Mill____, Cotton Gin____, Corn Oil Mill____

Soybean Oil Mill____, Vegetable Oil Mill____, Peanut Oil Mill____, Other (Specify)_____

A plant layout is required showing each source of emissions to the atmosphere (indicate for each the level above grade where the emission occurs). Correlate these emission points with the air pollution control device and process creating the dust.

STORAGE TANK DATA

(Not applicable_____)

List all storage tanks greater than 1000 gallon capacity, including those for crude petroleum and fuel oil. Emissions in tons/year should be reported here and on Page ( ) for each source.

Source Number	Tank Capacity 1000 Gals	Type Tank (Floating Roof) (Fixed Roof) (Pressure)	Material Stored	Monthly Thru-put 1000 Gals	Vapor Pressure PSIA @ °F	Control Pressure PSIG	Type of Vapor Control	% Eff.	Vent	
									Freq.	Tons/yr

Duplicate this sheet as necessary

PROCESS-WEIGHT SECTION

(Not applicable_____)

INSTRUCTIONS: List all process-weight information. (Fill out separate sheet for each process.)

NOTE: You are required to list all process-weight information. If any of this information relates to secret processes or methods of manufacture or production, identify it as such and attach a letter of justification. Such secret information will be held confidential within the (Agency).

Operating Schedule:_____hours/day _____days/week_____weeks/year

Process name or description:_____

(List source numbers and control devices below)

PROCESS MATERIALS

Input/Year

Materials	Tons/yr	Lb/hr

Output/Year

Materials	Tons/yr	Lb/hr

Source Number	Associated Air Pollution Control Devices	Date Installed	Pollutants Affected	Control Number	% Efficiency Rated	% Efficiency Oper.

Make an additional copy of this page for each additional process

EMISSION SOURCES SECTION

(Not applicable_____)

INSTRUCTIONS: Use one line for each source. Source numbers should match those used on your plant layout map and in other sections of the questionnaire.

Assure that all emission values for each source on this page correlate with the values for that source on Page 10.

Identify with a discharge stack or vent where applicable.

Source Number	List Pollutants Emitted		Average Flow Rate Of Each Pollutant		Stack Information					
	Chemical Composition	Wt%	Gaseous SCFM (70°F)	Particulate Lbs/Hr	Height Above Ground (Ft.)	Height Above Adjacent Structures (Ft.)	Internal Diameter At Exit (Ft.)*	Temp. Deg. (F)	Velocity (Ft/Sec)	Mois. Wt.%

*Or dimensions of noncircular stack.

ENCLOSE THE FOLLOWING INFORMATION:

1. Emissions other than through stacks (horizontal vents, etc.)
2. Results of tests indicating average particle size, density, etc., where available.

EMISSIONS DATA SECTION (Not applicable_____)

INSTRUCTIONS Use one line for each source. The source numbers should match those used on your plant lay-out map and in other sections of the questionnaire. Make additional copies as necessary. Show subtotals for each page and overall total on final page.

Type of emission source - code: 1 = stack; 2 = elevated flare; 3 = ground flare; 4 = open dump; 5 = incinerator; 6 = tank; 7 = fugitive loss

Calculated method for emissions - code: A = stack tests (attach copies); B = material balance; C = emission factors; D = estimate

---

Tons (2000 lb) of emissions per individual source for the calendar year

Source Number	Type Emission (Code)	Calc. Method (Code)	Nitrogen Oxides	Sulfur Dioxide	Hydro-carbons	Carbon Monoxide	Particu-lates	Hydrogen Sulfide	Sulfuric Acid	Fluor-ides	Other* (Specify)
Plant Total Emissions											

*Give chemical composition and tons/year - attach additional pages as necessary

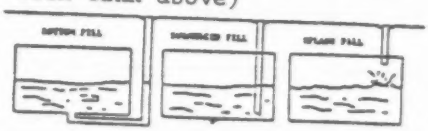
PETROLEUM PRODUCT STORAGE FACILITIES INVENTORY

(Not applicable_____)

I PETROLEUM PRODUCTS STORED AND QUANTITIES

TANK #	TANK CAPACITY (gallons)	PRODUCT STORED (type)	ANNUAL THROUGHPUT (gallons)

II METHOD OF FILLING (check appropriate box for each tank above)



TANK #			
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐

III Does this facility operate any air pollution control equipment such as vapor recovery?
Yes_____ No_____
If yes, please specify the type:

_____
_____
_____
_____
_____
_____

IV CLASSIFICATION: Retail Sales_____ Private Storage_____
Bulk Sales_____ Other (specify)_____

FOR OFFICIAL USE ONLY (Do not complete)

TANK #	STORAGE LOSS		LOADING LOSS		FILLING LOSS	
	Factor	Quantity	Factor	Quantity	Factor	Quantity

Check here if no gasoline is pumped at this facility _____

PUMP NUMBERS

Pump Number	1	2	3	4	5	6
Gasoline Type (e.g., Regular, No Lead, etc.)						
Midnight						
2 am						
4 am						
6 am						
8 am						
10 am						
12 Noon						
2 pm						
4 pm						
6 pm						
8 pm						
10 pm						
Midnight						

A. Storage tanks: Splash fill_____ Submerged fill_____

B. Frequency of gasoline deliveries to station. Every_____days

_____
Address

_____ _____
City Zip Code Signature (Owner or Lessor)/Date

SIC_____ ID_____ (Not applicable_____)

DRYCLEANING QUESTIONNAIRE

Before filling out the questionnaire please read the following instructions:

- Everyone receiving this form should complete Section I (General Information) and all other sections pertaining to their firm.
- The information submitted should pertain to the calendar year of (year).
- If the space provided is not adequate, feel free to either copy the form or use a separate sheet.

Your cooperation in filling out this form is greatly appreciated. It is anticipated that some of the data will not be available. Please supply as much information as possible to enable accurate calculations to be made and an accurate survey to be conducted. If you have any questions, feel free to contact the individual(s) listed on the enclosed cover letter. A stamped, return envelope has been enclosed for your convenience.

I. GENERAL INFORMATION

1. Company Name:_____

   Plant Address:_____

   City:_____ Zip Code:_____ County:_____

   Nearest Cross Street:_____

   Mailing Address (if different from above):_____

   City:_____ Zip Code:_____

   Has any of the above information changed since the last inventory?

   Yes_____ No_____

2. Person to contact about form:_____

   Telephone:_____ Title:_____

3. How much do you anticipate your growth will increase or decrease by the year 1990?

   Increase_____%

   Decrease_____%

4. Is this establishment engaged in cleaning clothes, uniforms, or any other fabric with any type of solvent?

   Yes_____ No_____

   If YES, please sign form and complete the remainder of the questionnaire.

   If NO, please sign form and return only this page.

Signature:_____ Date:_____

TECHNICAL DATA

1. Amount of clothes cleaned per year, if known = _____tons.

2. Type of operation.

☐ Transfer ☐ Dry to Dry

3. What type of business does your operation handle?

☐ Commercial ☐ Industrial

☐ Coin-Op ☐ Other (Specify)_____

4. Type and amount of solvent cleaner used during the year (year) and supplier's name and address.

Type of Solvent	Quantity Purchased (Gallons Per Year)	Supplier's Name and Mailing Address
Petroleum (Stoddard, 140°F)		
Perchloroethylene		
Freon 113		
Other (Specify)		

5. Amount of solvent returned to supplier or collector for reprocessing or disposal, if applicable. Specify type of solvent if more than one type is used.

_____gallons per year.

TOXIC AND HAZARDOUS MATERIALS

A. List below any substances used or produced in your facility which could cause immediate injury to life or property if they were emitted to the atmosphere. (Chlorine for water treatment, gases used as catalysts, etc., which do not normally escape.)

None_____ _____

_____

_____

_____

B. Does your facility use or produce asbestos, mercury (other than laboratory use), or beryllium in any amount whatsoever?

Yes_____ No_____

If yes, give amount_____

Safety precautions taken_____

_____

(YEAR) EMISSIONS INVENTORY QUESTIONNAIRE

EMISSION CHECKLIST

Give the source number(s) for any of the following elements or sample compounds containing them emitted during a process or as a fugitive loss.

	Source Number
Antimony	
Arsenic	
Barium	
Beryllium	
Boron	
Bromine	
Cadmium	
Chlorine	
Chromium	
Copper	
Fluorine	
Indium	
Iodine	
Lead	
Manganese	
Mercury	
Molybdenum	
Nickel	
Noble Metals	
Rare Earths	
Selenium	
Tellurium	
Thallium	
Tin	
Vanadium	
Zinc	
Other Heavy Metals	

Give the source number(s) for any of the following substances or products containing these substances emitted during a process or as a fugitive loss.

	Source Number
Aldehydes	
Ammonia or Ammonia Compounds	
Asbestos	
Carbonyls	
Chromic Acid	
Cyanide or Cyanide Compounds	
Disulfides	
Halogenated Hydrocarbons	
Herbicides	
Hydrochloric Acid	
Mercaptans	
Nitric Acid	
Odor Causing Compounds	
Organic Phosphate	
Organics	
Ozone	
Pesticides	
Phosphoric Acid	
Polynuclear Organics	
Sulfides	
Talc	
Volatile Organic Solvents	

Be sure to include emissions data for these sources on Pages ( )

Account Number _____

Name _____

LEAD

Emissions Inventory

Data for year ____

OFFICE USE ONLY

SIC ____

Primary Products _____ Secondary Products _____ Plant Location: (Deg., Min., Sec.) ___:___:___ N. Latitude ___:___:___ W. Longitude

PROCESS OPERATING DATA

Process		Primary Product	Seasonal Quantity Produced				Units	Fugitive Lead	
*PN	Name		Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec		Name of Compound	Quantity (T/Yr)

LIQUID AND SOLID WASTE DISPOSAL

EPN	Type of Waste	Type of Disposal	Seasonal Quantity Disposed of				Units	Lead ppm (wt)	Control(s)	
			Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec			Type	Eff

PROCESS STACK DATA

PN	EPN*	Stream Composition			Stack Height (ft)	Inside Dia at Exit (ft) ***	Temp (°F)	Velocity (ft/sec)	OR	Total Flow (ACFM)	Control Equipment	
		Component Name	Mole Wt	Conc**							Type	Eff (%)

*PN = Process Number; EPN = Emission Point Number

**For gases use volume %; for particulates use grains/SCF

***If rectangular or square, give dimensions.

VOLATILE LEAD COMPOUND STORAGE

EPN	Material Stored	Tank Capacity (1000 Gal)	†Type	††Seasonal Thru-put (1000 Gal)				Diameter (ft)	True Vapor Pressure PSIA @ °F		Mole Wt	Control Pressure	Type Vapor Control	Eff (%)	Paint Condition		Color		Average Outage (Vapor Space Height (ft)
				Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec								Good	Poor	Roof	Shell	

† Type of tank: External Float; External Float with Double Seal; Internal Float; Fixed; Pressure; Underground.

†† Use average thru-put. For new tanks calculate thru-put from tank displacement.

AUTHORIZING SIGNATURE _____ Name of Contact Representative _____ Telephone No.: (A. C.) _____

APPENDIX D

D-2: Example Follow-Up Letter

(OFFICIAL STATIONERY HEADING)

Gentlemen:

POSSIBLE SUSPENSION OF YOUR OPERATING PERMIT(S)

On or about (date), a letter was sent to you requesting information concerning the operation of your dry cleaning equipment. To assist you in furnishing this information, a survey form was supplied. The completed form should have been returned to us within 30 days of receipt of our letter. As of this date, it has not been received.

The (Statute) authorizes the (Agency) to request from the holder of a permit any information that will disclose the nature, extent or quantity of air contaminants which are or may be discharged by such source, and to suspend a permit to operate if the holder willfully fails or refuses to provide the information.

We ask for your cooperation in supplying us with the requested information within two weeks from the date of this letter. Should you require additional survey forms or desire any additional information regarding this questionnaire, please contact (name of agency person) (telephone).

Very truly yours,

(Name)
(Title)

APPENDIX E

EXAMPLE REFERENCE MATERIALS

E-2: Sample forms for input into the National Emissions Data System (NEDS) for a Point Source

E-3: Sample forms for input into the National Emissions Data System (NEDS) for an Area Source

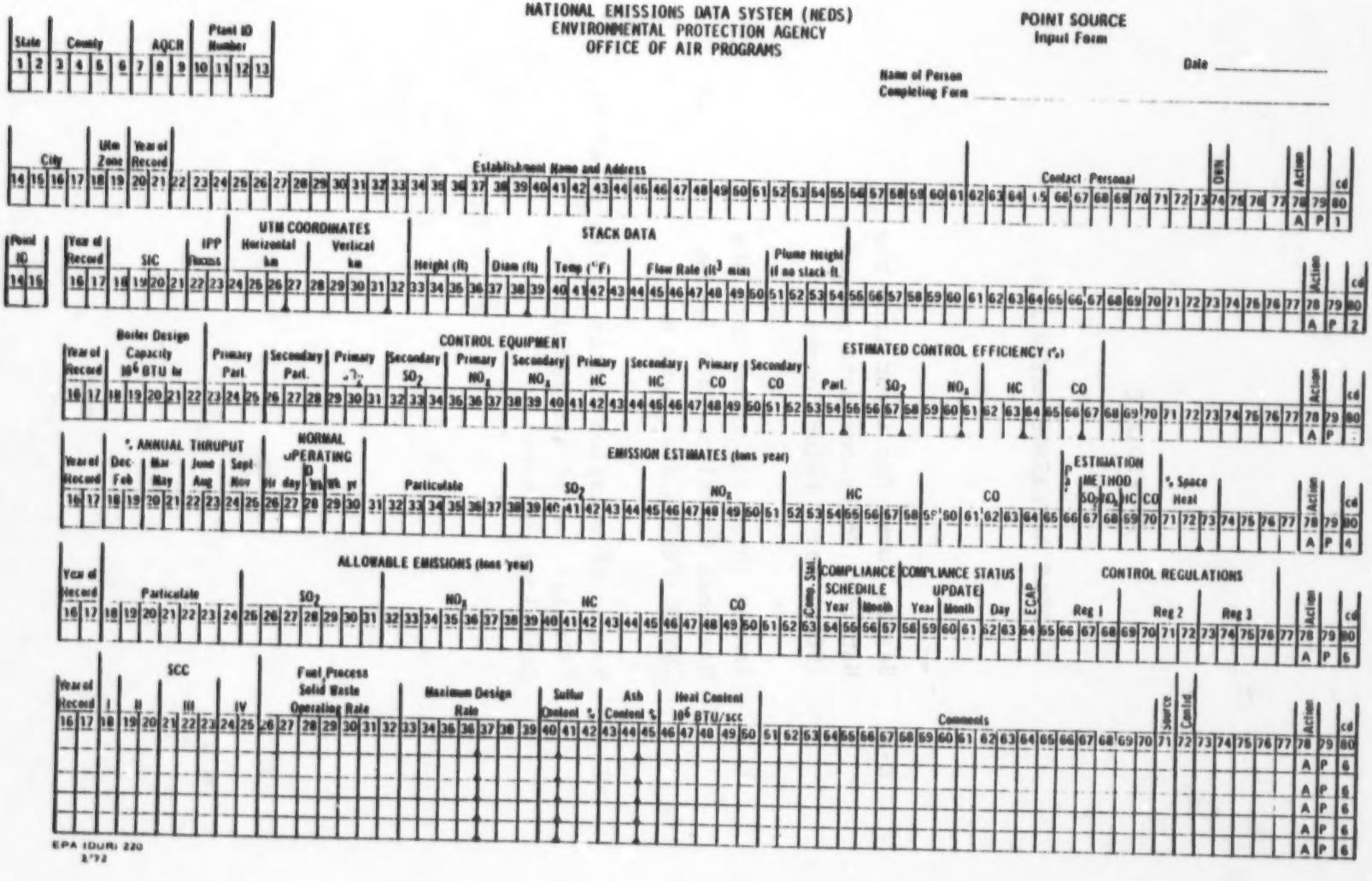
E-4: Sample of emission factor tables in AP-42, "Compilation of Air Pollutant Emissions Factors"

NATIONAL EMISSIONS DATA SYSTEM (NEDS)
ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF AIR PROGRAMS

POINT SOURCE
Input Form

Date _____

Name of Person
Completing Form _____



EPA (OAR) 220
3/72

NATIONAL EMISSIONS DATA SYSTEM (NEDS)
ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF AIR PROGRAMS

AREA SOURCE
Input Form
Date _____

Name of Person
Completing Form _____

State	County	AQCR
1 2	3 4 5	6 7 8 9

Year of Record	EMISSION ESTIMATES (10^2 tons)					SULFUR CONTENT (%)				ASH CONTENT (%)		RESIDENTIAL FUEL									
	Particulate	SO_2	NO_x	HC	CO	Anth. Coal	Bitum. Coal	Dist. Oil	Resid Oil	Anth. Coal	Bitum. Coal	Anth. 10^1 tons	Bitumin. 10^1 tons	Dist. Oil 10^4 Gal.	Resid. Oil 10^4 Gal.	Nat. Gas 10^7 ft.^{3}	Wood 10^2 tons	Action	cd
10 11	12 13 14 15 16	17 18 19 20 21	22 23 24 25	26 27 28 29 30	31 32 33 34 35	36	37	38	39	40	41	42	43	44 45 46 47 48	49 50 51 52 53	54 55 56 57 58	59 60 61 62 63	64 65 66 67 68	69 70 71 72 73	74 75 76 77	78 A	79 80 1

COMMERCIAL AND INSTITUTIONAL FUEL						INDUSTRIAL FUEL													
Anth. 10^1 tons	Bitumin. 10^1 tons	Dist. Oil 10^4 Gals.	Resid. Oil 10^4 Gals.	Nat. Gas 10^7 Ft.^{3}	Wood 10^2 tons	Anth. Coal 10^1 tons	Bitum. Coal 10^1 tons	C'to 10^1 tons	Dist. Oil 10^4 Gals.	Resid. Oil 10^4 Gals.	Nat. Gas 10^7 Ft.^{3}	Wood 10^2 tons	Process Gas 10^7 ft.^{3}						
10 11 12 13 14	15 16 17 18 19	20 21 22 23 24	25 26 27 28 29	30 31 32 33 34	35 36	37 38 39 40 41	42 43 44 45 46	47 48 49 50 51	52 53 54 55 56	57 58 59 60 61	62 63 64 65 66	67 68 69 70 71	72 73 74 75 76	77	78 A	79 80 2				

ON SITE INCINERATION			OPEN BURNING			GASOLINE FUEL			DIESEL FUEL										
Residential 10^1 tons	Industrial 10^2 tons	Comm. Inst. 10^2 tons	Residential 10^2 tons	Industrial 10^2 tons	Comm'l - Instit. 10^2 tons	Light Vehicle 10^3 Gals.	Heavy Vehicle 10^3 Gals.	Off Hiway 10^3 Gals.	Heavy Vehicle 10^3 Gals.	Off Hiway 10^4 Gals.	Rail Locomotive 10^4 Gals.	County Population 10^3	Decade Code						
10 11 12 13 14	15 16 17 18 19	20 21 22 23 24	25 26 27 28 29	30 31 32 33 34	35 36 37 38 39	40 41 42 43 44	45 46 47 48 49	50 51 52 53 54	55 56 57 58 59	60 61 62 63 64	65 66 67 68 69	70 71 72 73 74	75 76 77	78 A	79 A	80 3				

AIRCRAFT			VESSELS				EVAPORATION		MEASURED VEHICLE MILES										
Military LTO CYC 10^2	Civil LTO CYC 10^1	Commercial LTO CYC 10^1	Anth. Coal 10^1 tons	Diesel Oil 10^4 Gals.	Resid. Oil 10^4 Gals.	Gasoline 10^3 Gals.	Solvent Purchased tons/yr	Gasoline Marketed 10^5 Gals.	Limited Access Road 10^4 Miles	Rural Roads 10^4 Miles	Suburban Roads 10^4 Miles	Urban Roads 10^4 Miles							
10 11 12 13	14 15 16 17 18	19 20 21 22 23	24 25 26 27 28	29 30 31 32 33	34 35 36 37 38	39 40 41 42 43	44 45 46 47 48	49 50 51 52 53	54 55 56 57 58	59 60 61 62 63	64 65 66 67 68	69 70 71 72 73	74 75 76 77	78 A	79 A	80 4				

Dirt Roads Traveled 10^3 Miles	Dirt Air Strips LTO CYCLES	Construction Land Area 10^2 Acres	Rock Handling & Storing 10^3 tons	FOREST FIRES		SLASH BURNING		FROST CONTROL		Structure Fires #/year	COAL REFUSE BURNING								
				Area - Acres	Quant. tons/acre	Area - Acres	Quant. tons/acre	Orchard Heaters 10^3	Days Fluid days/yr		Size of Bank 10^3 yard^3	#/year							
10 11 12 13 14	15 16 17 18 19	20 21 22 23 24	25 26 27 28 29	30 31 32 33 34	35 36 37 38 39	40 41 42 43 44	45 46 47 48 49	50 51 52 53 54	55 56 57 58 59	60 61 62 63 64	65 66 67 68 69	70 71 72 73 74	75 76 77	78 A	79 A	80 5				

| COMMENTS | | | | | | | | | | | | |

Table 6.3-1. EMISSION FACTORS FOR COTTON GINNING OPERATIONS WITHOUT CONTROL[a,b]

EMISSION FACTOR RATING: C

Process	Estimated total particulate		Particulates >100 μm settled out, %[c]	Estimated emission factor (released to atmosphere)	
	lb/bale	kg/bale		lb/bale	kg/bale
Unloading fan	5	2.27	0	5.0	2.27
Seed cotton cleaning system Cleaners and dryers[d]	1	0.45	70	0.3	0.14
Stick and burr machine	3	1.36	95	0.2	0.09
Miscellaneous[e]	3	1.36	50	1.5	0.68
Total	12	5.44	—	7.0	3.2

[a]Reference 1.
[b]One bale weighs 500 pounds (226 kilograms).
[c]Percentage of the particles that settle out in the plant.
[d]Corresponds to items 1 and 2 in Table 6.3-2.
[e]Corresponds to items 4 through 9 in Table 6.3-2.

Table 6.3-2. PARTICULATE EMISSION FACTORS FOR COTTON GINS WITH CONTROLS[a] EMISSION FACTOR RATING: C

Emission source[b]	Emission factor	
	lb/bale[c]	g/kg
1. Unloading fan	0.32	0.64
2. No. 1 dryer and cleaner	0.18	0.36
3. No. 2 dryer and cleaner	0.10	0.20
4. Trash fan	0.04	0.08
5. Overflow fan	0.08	0.16
6. No. 1 lint cleaner condenser	0.81	1.62
7. No. 2 lint cleaner condenser	0.15	0.30
8. Mote fan	0.20	0.40
9. Battery condenser	0.19	0.38
10. Master trash fan	0.17	0.34
Total	2.24	4.48

[a]References 2,6-9.
[b]Numbers correspond to those in Figure 6.3-2.
[c]A bale of cotton weighs 500 pounds (227 kilograms).

APPENDIX F

F-2 to F-7: Supplementary References

The following references describe some of the background information required for the setting of Standards of Performance for various industries:

EPA 450/2-74-002A	Background Information for New Source Performance Standards: Primary Copper, Zinc, and Lead Smelters. Vol. 1 - Proposed Standards. 10/74.
EPA 450/2-74-009A	Background Information on National Emission Standards for Hazardous Air Pollutants, Proposed Amendments to Standards for Asbestos and Mercury. 10/74.
EPA 450/2-74-017A	Background Information for Standards of Performance: Electric Arc Furnaces in the Steel Industry. Vol. 1 - Proposed Standards. 10/74.
EPA 450/2-74-017B	Background Information for Standards of Performance: Electric Arc Furnaces in the Steel Industry.
EPA 450/2-74-018A	Background Information for Standards of Performance: Electric Submerged Arc Furnaces Producing Ferroalloys. Vol. 1: Proposed Standards. 10/74.
EPA 450/2-74-018B	Background Information for Standards of Performance: Electric Submerged Arc Furnaces for Production of Ferroalloys. Vol. 2: Test Data Summary. 10/74.
EPA 450/2-74-018C	Background Information for Standards of Performance - Electric Submerged Arc Furnaces for Production of Ferroalloys. Vol. 3 - Supplemental Information. 4/75.
EPA 450/2-74-019A	Background Information for Standards of Performance: Phosphate Fertilizer Industry. Vol. 1 - Proposed Standards. 10/74.
EPA 450/2-74-019B	Background Information for Standards of Performance: Phosphate Fertilizer Industry. Vol. 2: Summary of Test Data. 10/74.

EPA 450/2-74-020A — Background Information for Standards of Performance: Primary Aluminum Plants. Vol. 1 - Proposed Standards. 10/74.

EPA 450/2-74-020B — Background Information for Standards of Performance: Primary Aluminum Plants. Vol. 2: Summary of Test Data. 10/74.

EPA 450/2-74-020C — Background Information for Standards of Performance: Primary Aluminum Industry. Vol. 3 - Supplemental Information. 1/76.

EPA 450/2-74-021A — Background Information for Standards of Performance: Coal Preparation Plants. Vol. 1: Proposed Standards. 10/74.

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EPA 450/3-76-038A — Background Information on Hydrocarbon Emissions from Marine Terminal Operations: Vol. I - Discussion. Radian Corp. 1976.

EPA 450/3-76-038B — Background Information on Hydrocarbon Emissions from Marine Terminal Operations: Volume II - Appendices. Radian Corp. 1976.

EPA 450/2-76-002 — State Implementation Plan Emission Regulations for Sulfur Oxides - Fuel Combustion. 3/76.

State Support and Environmental Impact Statements for various industries are described in the following references.

EPA 450/2-75-009 — Standard Support and Environmental Impact Statement - Emission Standard for Vinyl Chloride. 10/75.

EPA 450/2-75-009B — Standard Support and Environmental Impact Statement: Volume 2 Promulgated Emission Standard for Vinyl Chloride. 1976.

EPA 450/2-76-014A — Standard Support and Environmental Impact Statement: Vol. 1 Proposed Standards of Performance for Kraft Pulp Mills. 1976.

EPA 450/2-76-016A — Standards Support and Environmental Impact Statement: Vol. 1 Proposed Standards of Performance for Petroleum Refinery Sulfur Recovery Plants. 1976.

EPA 450/2-76-030A — Standards Support and Environmental Impact Statement: Vol. 1 - Proposed Standard of Performance for Lignite-Fired Steam Generators. EPA: OAQPS 1976.

EPA 450/2-77-001A — Standards Support and Environmental Impact Statement: Vol. 1 - Proposed Standards of Performance for the Grain Elevator Industry. EPA: OAQPS 1977.

EPA 450/2-77-005 — Control of Fluoride Emissions from Existing Phosphate Fertilizer Plants: Final Guideline Document. EPA OAQPS 1977.

EPA 450/2-77-007A — Standards Support and Environmental Impact Statement: Vol. 1 - Proposed Standards of Performance for Lime Manufacturing Plants. EPA: OAQPS 1977.

EPA 450/2-77-017A — Standards Support and Environmental Impact Statement: Vol. 1 - Proposed Standards of Performance for Stationary Gas Turbines. EPA: OAQPS 1977.

Various control methods, their efficiencies, costs, and emissions resulting from them, are discussed in the following references.

EPA 450/2-76-028 — Control of Volatile Organic Emissions from Existing Stationary Sources: Vol. 1 - Control Methods for Furnace Coating Operation. 1976.

EPA 450/2-77-022 — Control of Volatile Organic Emissions from Solvent Metal Cleaning. OAQPS No. 1.2-079. November 1977.

EPA 450/2-77-025 — Control of Refinery Vacuum Producing Systems, Wastewater Separators, and Process Unit Turnarounds. OAQPS No. 1.2-081. October 1977.

EPA 450/2-77-026 Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals. OAQPS No. 1.2-082. October 1977.

EPA 450/2-76-028 Control of Volatile Organic Emissions from Existing Stationary Sources Volume I: Control Methods for Surface-Coating Operations. PB 275 292. December 1977.

EPA 450/2-77-008 Control Volatile Organic Emissions from Existing Stationary Sources Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks. OAQPS No. 1.2-073. May 1977.

EPA 450/2-77-032 Control of Volatile Organic Emissions from Existing Stationary Sources Volume III: Surface Coating of Metal Furniture. OAQPS No. 1.2-086. December 1977.

EPA 450/2-77-033 Control of Volatile Organic Emissions from Existing Stationary Sources Volume IV: Surface Coating for Insulation of Magnet Wire. OAQPS No. 1.2-087. December 1977.

EPA 450/2-77-034 Control of Volatile Organic Emissions from Existing Stationary Sources Volume V: Surface Coating of Large Appliances. OAQPS No. 1.2-088. December 1977.

EPA 450/2-77-035 Control of Volatile Organic Emissions from Bulk Gasoline Plants. OAQPS No. 1.2-085. December 1977.

EPA 450/2-77-036 Control of Volatile Organic Emissions from Storage of Petroleum Liquids in Fixed-Roof Tanks. OAQPS No. 1.2-089. December 1977.

EPA 450/3-73-003A Emissions Control in the Grain and Feed Industry, Vol. 1. Engineering and Cost Study. 12/73. Midwest Research Inst. 1973.

EPA 450/3-73-003B Emissions Control in the Grain and Feed Industry. Vol. 2. Emission Inventory. 9/74. Midwest Research Inst. 1974.

EPA 450/3-73-004A Air Pollution Control in the Primary Aluminum Industry. Vol. 1 of 2 (Sections 1 through 10). 7/73. Singmaster and Breyer. 1973.

EPA/450-3-73-004B	Air Pollution Control in the Primary Aluminum Industry. Volume 2 of 2 (appendices). 7/73.
EPA 450/3-74-002	Evaluation of the Controllability of Power Plants Having a Significant Impact on Air Quality Standards. 2/74.
EPA 450/3-74-015	Factors Affecting Ability to Retrofit Flue Gas Desulfurization Systems. 12/73. Radian Corp. 1973.
EPA 450/3-74-036A	Investigation of Fugitive Dust: Vol. I - Sources, Emissions, and Control. PEDCo Env. Specialists. 1974.
EPA 450/3-74-036B	Investigation of Fugitive Dust: Vol. II - Control Strategy and Regulatory Approach. PEDCo Env. Specialists. 1974.
EPA 450/3-74-060	Air Pollution Control Technology and Costs - Seven Selected Emission Factors. 12/74. Indust. Gas Cleaning Inst. 1974.
EPA 450/3-74-063	Particulate Emission Control Systems for Oil-Fired Boilers. 12/74. Geomet. 1975.
EPA 450/3-75-046A	A Study of Vapor Control Methods for Gasoline Marketing Operations. Vol. 1 - Industry Survey and Control Techniques. 4/75. Radian Corp. 1975.
EPA 450/3-75-046B	A Study of Vapor Control Methods for Gasoline Marketing Operations. Vol. 2 - Appendix. 4/75. Radian Corp. 1975.
EPA 450/3-75-047	Comparison of Flue Gas Desulfurization Coal Liquefaction and Coal Gasification for Use at Coal-Fired Power Plants. Kellogg MS Co. 1975.
EPA 450/3-76-005	Control of Particulate Matter from Oil Burners and Boilers. Aerotherm Corp. 1976.
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